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OURSELVES.

Change, sometimes called progress, is in unceasing pursuit of man; to-day may call the latter to existence; to-morrow witnesses his death; and yet in his brief span the landscape takes to itself colours ever varying, if not new to the universe, and the old familiar tints fade rapidly beyond his ken. Nor are the works of his hands forgotten; no more than the shifting sand dune can The Journal of Agriculture hope to clothe itself in immovableness. It is to be feared that the threads of old associations are snapping around us, and that we are drifting into regions as yet unknown. Had our lot been cast with the more ephemeral portion of the press we might in accordance with time-honoured custom unblushingly claim that with us at least change was synonymous with progress; monthly issues, however, engender habits of reflection, the first-fruits of which are modesty and ungrudging recognition of the work of others. And thus we dare not anticipate the verdict of our readers, nor attempt to persuade them that we are now one of the three best conducted agricultural papers in the world!

Our past; well, it lies behind us in so many monthly milestones; nor would we obliterate them had we the power. We have far less compunction in drawing attention to what we have done than to what we think we are about to do. The value of this Journal's past work has been variously appraised; but none perhaps realize it more truly than those whose sneers were launched out, but as confident preliminaries to the unctuous obituary; so rarely does competition beget unbiased judges! This Journal has been the cement that has bound together in common thought some of the foremost agriculturists of the state; the leaven that has stimulated them to activity and good fellowship. Under ordinary circumstances improvements in the practice of agriculture spread but slowly, and then, like oil stains, only in concentric circles from one common centre. Can it be said that such has been the case with us? That there remain many whose general practice might still be improved cannot, unfortunately, be denied; but so suddenly have the generating centres sprung up on the map of South Australia, and so completely have the oil stains invaded it, that though the parent stains may still be located, not Solomon in all his wisdom could to-day confidently classify districts in degrees of progressiveness or advancement. All honour to the initiators and teachers, the parent stains; but let us not forget the binding, the leavening medium that has spread far and wide what might long have remained the property of the few.

And here a sacred duty bids us pause in the consideration of our own affairs, lest we forget what is incumbent on filial piety. After the issue of our July number that grand old figure, whose lifework has been consecrated to the advancement of the agricultural interests of this state, threw over the reins to less experienced hands; to him in a sense we owe our origin, and the fostering care that tended our troublous youth. It is easy to imitate; easy to continue the well-started task; easier still to criticise. Let us hope that Mr. Molineux's work will be neither forgotten nor belittled, because to others has fallen the task of continuing and completing that which originated with him. Adequate commendation of his work cannot be conveyed in a few sentences. We cannot, however, bid him farewell without brief reference to it. A study of Nature's secrets formed a fitting training to the occupation that subsequently absorbed all his energies, the enlightening, the guiding of those in closest contact with Nature—the agricultural community. A diligent student, he was well acquainted with the various improvements that science was gradually introducing into the agriculture of the nineteenth century. A journalist by instinct and training, and endowed with enthusiasm that nothing could damp, he made himself the special advocate of agricultural progress. In this role he soon perceived that the proverbial conservatism of tillers of the soil might be traced to the comparative isolation attendant on rural pursuits; and it was then that he conceived what has since proved such a boon to the state, a series of associations scattered throughout the agricultural districts, and connected one with the other by a common bond, The Journal of Agriculture. Of his accomplished task he has reason to be proud. He has well earned the gratitude of South Australian agriculturists, and we earnestly trust that when in September next they meet in what has been aptly termed the Producers' Parliament, they will not begrudge him unstinted recognition of what he has well earned.

It is well to have a past; it is a stimulating standard of comparison; but better still the mind that discerns the factors that must conduce to the successes or the failures of the future. We are not so endowed, and we cannot at this present juncture bring ourselves to map out the plans whereby we hope to retain the confidence of our readers, and, if possible, widen their circle. The spirit that actuates us could not lead us astray; pen and ink might betray us. And, moreover, we refuse to be fettered. This Journal must continue to be the living expression of agricultural progress in the state; the bond of union between hundreds of agriculturists resolved to bring their art up to the standard of modern improvements; a source of information to every enquirer. That is our view of the purposes our Journal should fulfil; that they be fulfilled shall be our constant endeavour. But how, and by what means, seems of little importance; let the tale unfold itself. From our readers we welcome every suggestion, and to what is practicable and of value effect shall be given. To all members of the Branch Agricultural Bureaus we appeal in particular. We require information on all matters of agricultural interest, having reference to their respective districts; reports concerning weather, crops, and especially concerning carefully conducted and verified individual experiments. To all those requiring advice or guidance in such matters it can readily be obtained either by direct application to the Department of Agriculture, or through the medium of The Journal.

AGRICULTURAL BUREAU CONGRESS.

The fourteenth annual congress of the Agricultural Bureau of South Australia will be held in the Federal Hall, Central Market, Grote street, Adelaide, during Show week, in September. The opening addresses will be delivered on the evening of Tuesday, September 9, and there will be three sessions on Wednesday, two on Thursday, and one on Friday. Professor J. D. Towar, the recently appointed Professor of Agriculture, has agreed to give an address dealing with some practical agricultural subject. A new departure will be made in the holding of an "Officers' Conference," the object being to have a gathering of Chairmen and hon. secretaries to discuss the business management of the branches, and also to discuss the working of the Bureau under the altered circumstances. The suggestion for this conference emanates from Mr. T. A. Wilson, hon. secretary of Port Pirie branch, and it is hoped that the officers of the various branches will support the movement. The usual "Free Parliament," for 15-minute discussions of practical subjects will be held on the Friday morning. Two railway tickets will be available for each branch, and a full attendance of members is particularly desired.

DEPARTMENTAL NOTES AND WORK.

On the 30th of last month the Governor in Council approved of the nomination of the following gentlemen to the new Council for Agriculture, called into existence to replace the late Central Agricultural Bureau, Dairy Board, and Council for the Agricultural College:—Messrs. John Murray, President of R.A. and H. Society; A. D. Bruce, President of the S.A.V. Association; R. Caldwell; J. W. Sandford, of Messrs. A. W. Sandford & Co.; T. E. Yelland, of S.A. Farmers' Co-operative Union; John Miller and Richard Marshall, late members of the Central Agricultural Bureau; A. M. Dawkins, member of the late Council for the Agricultural College; G. R. Laffer and J. Rowell, fruitgrowers; and B. Basedow, of Messrs. Cholmondeley & Bosanquet, Reynella.

It is believed that the association of these gentlemen with the department will result in much good to the many-sided agricultural interests. Every branch of rural pursuits is represented—farmers, stock breeders, vinegrowers, and fruitgrowers. The Roseworthy College is represented by three former students, so that this excellent institution should not suffer from lack of interest of the new council.

The council's duties will include supervision of the department and tendering advice to the Minister on questions of agricultural interest. It is anticipated that the council's first meeting will take place on the 13th of August. In all probability the Chairman of the council will preside over the approaching congress of the Agricultural Bureau.

The greater part of the time of the Inspectors of Fruit during the past month was taken up with the examination of apples imported from Tasmania. At the present time of year no country inspectors are employed. Inspector Kelly, however, examined a few orchards in the Clare district. Mr. Quinn gave pruning demonstrations at Lyndoch, Cherryville, and Meadows; in addition to his weekly classes in connection with the School of Mines.

Professor Perkins acted as judge of rod-pruning at the Royal Agricultural and Horticultural Society's pruning match held at Bankside. We must congratulate the society on the number of entries, which, we believe, established a record.

The second session opened at the Roseworthy Agricultural College on the 23rd of last month. The number of students in residence continues good amounting at the present time to 46. Crops on the college farm are fairly satisfactory, though feed is very backward. A Shropshire ram was presented to the institution last year by Mr. S. S. Ralli, of Werocata, and it will be possible to compare some of his progeny with the half-bred Dorset lambs, that have in the past proved so successful there. We anticipate being able to supply our readers with some comparative figures on the subject in our next issue.

The department has made arrangements with the School of Mines for the delivery of a course of lectures on poultry-breeding by Mr. D. F. Laurie, poultry expert. The group will cover a series of 12 lectures, delivered at the School of Mines buildings on Friday evenings. A charge of 5/ will be made for attendance.

Some time since the department purchased a small flourmill for the purpose of testing the milling qualities of the different varieties of wheat grown in this State, but more particularly the new crossbreds and selections, with a view to determining before they are grown on an extended scale whether they are of better quality than varieties already in cultivation. This mill was sent to the Roseworthy Agricultural College, but the Hon. Minister of Agriculture has decided that it will be more convenient to those most interested in the work to have the mill erected at the School of Mines, Adelaide. The council of that body has accepted the offer of the Minister, and it is expected that the mill will soon be available for the purpose for which it was purchased. As soon as details of working are arranged by the School of Mines publicity will be given through The Journal.

NOTES AND COMMENTS.

London telegrams, dated July 27, report that the July wool sales closed with an exceedingly firm market. Shortly, the news by cable is that good merino wool has risen 5 per cent. since the close of previous series of sales, that fine crossbreds show a similar advance, with common merino also a shade higher. Medium crossbreds show a decline of nearly 5 per cent., and coarse crossbreds and Lincolns quite 6½ per cent. below price for May sales. As compared with last year's prices at the Adelaide wool sales the differences in price are approximately:—Good merinos in light condition, 2d. to 2½d. per ℔. rise; ordinary merino, which includes wool grown on fallow land, 1½d. to 2d. higher; extra fine crossbreds or comebacks, 2½d. higher; medium crossbreds and half-breds, 1½d. higher; very coarse crossbreds and Lincolns, ½d. to 1d. higher than in October and November, 1901.

Mr. D. M. Onwake, himself a farmer, and secretary of the Pennsylvania Farmers' Alliance, writing to The American Fertilizer, says:—"A farm adjoining mine that 20 years ago was too poor to carry even a mortgage . . . to-day is the best farm in our township, if not in the county. Although last year the wheat crop failed to fill, yet the crop was almost 3,000 bush., and 2,000 barrels of corn. Its productiveness is due to phosphate and (farmyard) manure. The farm contains 200 acres, and will bring $100 per acre. From 200 ℔. to 300 ℔. of phosphate per acre are used every year, yet there are some who ignorantly assert that phosphate will make a farm poor."

Last season, in reply to an enquiry, the late editor strongly recommended a farmer, whose crops were attacked by red rust, to cut the wheat with a binder as soon as it was past the dough stage and allow it to ripen in the stooks. Mr. Molineux expressed the opinion that cutting the wheat would arrest the progress of the fungus, and that unless the grain was already affected it would fill out all right. Several farmers who adopted this practice with part of their crops have since reported that while they got a good sample from the wheat they cut and threshed, the portion of the crop left for the stripper was very badly affected by rust. Farmers would do well to test this matter for themselves should rust unfortunately attack the crops this year, as even if the grain should not fill out in the sheaves, they will have a supply of hay.

In this issue we publish some statistics concerning the wine industry of Australia, for which we are indebted to Mr. J. Boothby, of the Statistical Office. These figures will bear careful perusal; in fact, they are worthy of very careful study on the part of all interested in the industry. The figures concerning the position of the industry in the respective States are very significant, and in next issue we propose to deal with several points which seem worthy of criticism and elaboration.

We are glad to notice in The Australian Vigneron and Fruitgrowers' Journal for July, a very pertinent reply from Mr. E. Mazure's pen, on the statements in reference to ports that apparently have been blindly accepted by our winemakers since Mr. Feuerheerd's recent visit to Australia. The ostensible object of this gentleman's visit was to try and get his wines introduced into Australia. Unfortunately for him he discovered that our wise laws look upon anything above 35 per cent. p.s., as brandies or liqueurs and not wines, and tax them accordingly. Now, as his ports, according to his statements, must stand at 42 per cent. p.s., the position was somewhat difficult; to overcome it he set about persuading local makers that they could not hope to produce good ports until they were able to raise them to 42 per cent. p.s. So persuasive was his eloquence that he succeeded in getting a committee of the S.A. Vingrowers' Association to wait on the Minister of Customs, and urge him to raise the limit from 35 to 42. We welcome Mr. Mazure's outspoken criticism; no port, nor any other type of sweet wine need be raised beyond 35, excepting, as he adds, when it has undergone initial disease fermentation, which should be avoided by other means. We should also like to endorse his very correct statement that Australian viticulture has nothing to learn from Portugal's rather primitive methods.

The Royal Agricultural and Horticultural Society held their annual vine-pruning competition on the 10th of July. Entries established in point of numbers a record. This goes far to show to what extent the society's efforts to improve pruning in the State are appreciated. The improvement itself is undeniable. Whereas 10 years ago, when the matches were first started, the work of even the prizetakers was frequently questionable, this year the 50 odd competitors present on the ground might with one or two exceptions be set down as good pruners. The task of awarding the prizes for most meritorious work becomes yearly more difficult; and we are glad to see that the questionable practice of giving a judge half an hour to judge of the work of a large body of men pruning as fast as they can is gradually being discontinued. We hope that in future even more time will be given to the preliminary test, during which the judge takes the man by himself and has not his attention distracted by the work of others. The final test should be reserved merely for those men whom the preliminary examination has shown to be among likely prizetakers.

Why is it that some central society does not start "Fruit tree pruning matches?" Nobody will deny that as a whole the vines of this State receive better treatment than our fruit trees. What the matches have done for vine pruning during the past 10 years they might well do for fruit trees in the near future. Four tests would be necessary—the apple, the pear, the peach, and the apricot, for each of which a separate judge should be appointed; and, perhaps, a fifth for the forming of young trees. It would not be necessary to prune a whole tree—10 to 15 minutes' work on each tree should give the judges ample time for estimating the quality of the work of each competitor. We hope to see the matter taken up, if not this season, during the course of 1903.

Mr. E. Burney Young writes that the shipments of Daria grapes to London last season were in most instances comparative failures. Apparently the grapes were packed too ripe, with the result that a large proportion rotted on the way, considerably reducing their market value. In one shipment of over 300 cases of White Daria the prices realized from 8/ per case for four cases down to 1/9 per case, only 10 cases fetching over 4/. Red Darias fetched 3/9 per case for 39 cases and 1/9 per case for three cases. The shipment ex Orestes arrived in better condition, the prizes realized being 4 cases at 18/, 1 at 17/, 15 at 15/, 9 at 14/, 4 at 12/, and 2 at 6/. It is evident that special care in selecting the fruit must be exercised at this end.

Recently the Minister for Agriculture for Great Britain gave some figures concerning the relative prices paid for milk in Canada, Denmark, and Australia. In Denmark the average price paid by the co-operative dairies ranges from 5d. to 5¼d. per gallon; in Canada about 4⅜d. per gallon is paid at the cheese factories; while the average of 13 co-operative factories in Australia whose figures were available showed that the price averaged from 3⅛d. to 4⅝d. per gallon. Without some idea of the relative qualities of the milk it is impossible to make a comparison as to the amounts paid in Australia and Denmark for butter fat: while the price per gallon is considerably higher in Denmark than in Australia, it may be that there is much less difference between the cost of butter fat in the respective countries.

A poultry census has just been completed in the United States. Not only do American farmers know the value of the poultry industry, but the Government also are alive to its importance, and the figures produced by the decadel census, which have just been made public, ought to cause farmers and others here to stop and ponder. In its tabulations the Census Bureau gives the number of farms in the States as 5,739,637, and on them the total number of fowls three months old and over was as follows:—Chickens, including guinea fowls, 233,598,085; turkeys, 6,399,376; geese, 5,676,863; ducks, 4,807,358. The numbers of nearly all these classes of poultry are smaller than in 1890, owing to the fact that in 1890 they reported all fowls of whatever age, while in the last census only those three months old and over were reported. The value of poultry on hand on the 1st of June, 1901, was 85,794,996 dollars; the value of poultry raised in 1899 was 136,891,877 dollars; and the value of eggs produced in 1899 was 144,286,158 dollars. The total income derived by the farmers from their poultry industry representing the total value of the eggs produced, as well as the poultry raised, was 281,178,035 dollars. This total makes the poultry industry one of the largest connected with agriculture.

It is estimated that in Victoria about one million eggs have passed through the cold storage chambers in the past six or seven months, and that the amount paid to the Government for freezing and storage was about £700, leaving a profit to the speculators, who placed the produce in the chambers, of something over £2,000. When the eggs were bought the ruling price was from 7½d. to 8d. per dozen, and by the time they were taken out for sale, or to be used by the owners, the price had increased to 1/3 and over, reaching as high as 1/6 per dozen. The cost of storage for 30 weeks came to about 2½d. per dozen, this including the maintenance of a temperature of from 33 to 35 deg. The results of the experiments with cold storage so far have been perfectly satisfactory, not only on account of the cheapness of treatment, but because the eggs at six months old open up as sound and free from characteristic flavour as when they were newly laid. The troubles of the past in connection with setting eggs aside for the season of scarcity and dearness have been those associated with unpleasant flavours derived from packing or from the process of preservation treatment. All faults are absent from the cold storage method, and it is regarded as probable that in the incoming season, the Agricultural Department will make arrangements for more fully meeting the demands for space that are regarded as certain to be made.—Australasian.

Although the cultivation of beetroot for the purpose of making sugar has so far been a failure in Victoria, the local press report that dairymen are beginning to realize the value of beetroot as a fodder for their stock. Mr. W. Thomas, a dairy farmer near Traralgon, in Gippsland, began feeding his cows on beetroot at the end of March, with the result that from 19 cows, on half an acre, his milk cheque came to £36 17/ for two months. Mr. Thomas's next-door neighbour, Mr. Beard, was much impressed with these results, especially as from 15 cows, fed in the ordinary way, he had received £7 5/ only for the month of April. Mr. Beard, therefore, began to feed on beetroot at the end of April, and was gratified to find that for the month of May his milk cheque rose to £13 7/1. The varieties of beet most suitable for feeding purposes are Wilmorin's Improved, Heine's Vilmorin, White Silesian, Imperial Red, and Pans Yellow.

ROSEWORTHY AGRICULTURAL COLLEGE EXPERIMENTAL FARM.

Financial Statement for Season 1901-2.

By Arthur J. Perkins, Secretary for Agriculture.

In years gone by it was the fashion with some to sneer at results obtained on the Roseworthy College Farm; they were charitably ascribed to liberal backing by the Government purse. It would be an insult to the inteligence and enterprise of our producers to suppose that the Farm was originally established to show that money could be made out of the land; it is more likely that its founders had in view the possibility of testing, and subsequently popularising in this state, improved methods that had proved successful elsewhere. The question of whether the Farm would prove a good investment for Government money, or even merely become self-supporting, was at the outset probably never contemplated. All that was apparently expected from it was a series of object-lessons, in which the question of cost was not taken into consideration. As an abstract question it might easily be argued that such an attitude was in the main correct: in practice it proved a dead failure. Magnificent crops did not appeal to the practically minded man, who in his own district perhaps only managed to make ends meet. To his mind such returns, such results, could not possibly be obtained at a profit; and he left the institution soured and embittered with the thought that he could do as much, if not more, had he access to the Government purse. And in this manner Roseworthy results were discounted, and Roseworthy practice was not followed. The late Principal, Professor Lowrie, was not long in finding out where the difficulty lay, nor in fixing on the only possible remedy. It became his constant endeavour to show those for whose sole benefit the College was brought into existence that those concerned with its management were not spendthrift theory spinners, but that placed in different circumstances they might in the struggle for life have competed successfully with the ablest of their critics. The conditions under which the College Farm was worked long delayed Professor Lowrie's aspirations. A yearly grant was allowed by the State to cover working expenses, but not a particle of the revenue could be used, so that we were in the anomalous position of dreading a good year, which by its extra expenditure would exhaust our vote and involve us in financial difficulties. And under such conditions it was practically impossible to produce a satisfactory balance-sheet. Professor Lowrie asked for the abolition of the yearly grant, and for permission to work the Farm out of its own returns—the institution could not only be self-supporting, but could return to the State interest for the money already spent. The reasonableness of this request did not at first make itself felt at headquarters. In 1899, however, it found able advocates in the Under-Treasurer and the College Council, who pressed the matter under the notice of the then Minister of Education and Agriculture, the Hon. R. Butler. The alteration was agreed to, and the Minister struck off the Farm grant from the 1899-1900 Estimates, allowing, however, an advance of £300 to cover outstanding liabilities. I do not believe that the Government have since had occasion to regret the step that they were induced to take on that occasion.

The daily press has already given more or less fragmentary statements of the Farm finances for the past season. We are able in this issue to reproduce in full all that has reference to financial operations conducted on the Roseworthy Farm from April 1, 1901, to March 31, 1902.

A brief reference to previous seasons' results will not be without interest. When the Farm was taken over in July, 1899, the net working capital, representing saleable stock, implements, bank balance, &c., was estimated at £1,809 13/3. Since that time the successive accumulation of profit balances has caused the original net capital to progress as follows:—

July 1, 1899	£1,809	13	3
March 31, 1900	2,588	13	1
March 31, 1901	3,905	17	9
March 31, 1902	5,227	11	3

This means that during the course of 2 years and 9 months the College Farm has earned £3,417 18/, or nearly twice the amount of the estimated original working capital.

We append below the balance-sheet, as drawn up on March 31 of the present year. The balance, £5,227 11/3, represents the net working capital at the beginning of the present financial year.

Balance-sheet March 31, 1902.

Liabilities.	£	s.	d.
Debts payable	33	18	10
Balance	5,227	11	3
	£5,261	10	1

Assets.				£	s.	d.
Debts receivable				337	17	11
Value of Stock, &c.:—						
Horses	£372	0	0			
Cattle	116	0	0			
Sheep	180	16	8			
Pigs	207	16	0			
Implements	876	1	0			
Bags	23	4	8			
Sundries—						
Dairy	55	14	6			
Workshop . .	101	13	6			
Miscellaneous	164	16	5			
Wheat	416	5	4			
Seeds (oats) . .	60	6	0			
Hay	887	0	0			
Straw	100	0	0			
Manure	158	17	8			
Salt	2	16	0			
Harness	52	8	2			
Fencing-						
New Fences	109	5	0			
Material . .	133	1	11	4018	2	10
Deposit Account (Credit Bank Balance)				905	9	4
				£5,261	10	1

Profit and Loss Account March 31, 1902.

The "profit and loss account" which follows requires some explanation. The balance, £1,321 13/6, may be taken as representing quite correctly the gross profit realized in the aggregate on the various transactions conducted on the Farm during the past season; but sums opposite the subsidiary accounts, such as sheep, pigs, wheat, &c., cannot be looked upon as giving even approximately a correct idea of the position of these several accounts. For instance, "Pigs account" shows an apparent profit of £321 13/9. This sum is a balance, but not really a profit, because it has been artificially increased at the expense of "Wheat" account, which has not been credited with wheat eaten by the pigs. In short, though the balances of the various accounts must not be taken as actual profits to their credit, as the increment to the profit of one account is always made at the expense of that of another, the difference betwixt the respective sums total of credit and debit balances correctly represents the gross profit earned by the Farm. We now append copy of this profit and loss account.

	£	s.	d.		£	s.	d.
To implements account	157	9	0	By cattle account	125	8	2
" harness	3	3	8	" sheep	242	1	9
" bags	30	4	7	" pigs	321	13	9
" horses	33	4	0	" wheat	327	7	1
" seeds (oats)	67	17	1	" straw	52	19	5
" sundries'	47	15	2	" hay and chaff	1,393	14	6
" salt	0	14	0	" miscellaneous . .	456	14	6
" manure	168	13	11	" permanent improvements	19	2	9
" garden	1	17	8				
" petty expenses	1	1	4				
" working	1,105	8	0				
" balance	1,321	13	6				
	£2,939	1	11		£2,939	1	11

Capital Account March 31, 1902.

The capital account, which is given below, confirms the results of balance-sheet and profit and loss account.

	£. s. d.		£ s. d.
Net capital 1/4/01	3,905 17 9	Net capital 1/4/02	5,227 11 3
Balance	1,321 13 6		
	£5,227 11 3		£5,227 11 3

Transactions April 1, 1901, to March 31, 1902.

For ordinary purposes the capital account should close the financial statement for the year. It occurred to us, however, that an enumeration of transactions covered during the year could not but prove of general interest.

Sales			Purchases—		
Straw ...	£155 1 1		Implements and parts	£353 0 8	
Hay	954 14 6		Harness and repairs	14 0 0	
Wheat ..	375 19 7		Bags	14 16 9	
Oats ...	52 17 11		Seeds	25 9 0	
Horse	5 0 0		Manure ..	169 15 4	
Cattle	103 2 9		Fencing material ..	201 3 6	
Dairy produce ..	113 2 11		Kerosine ..	30 10 6	
Lambs ..	48 3 1		Oils	10 0 0	
Pigs	368 17 9		Timber ..	18 19 10	
Sheepskins	103 4 3		Binder wire	27 12 10	
Wool ..	66 19 3		Binder twine ..	45 5 10	
Sundries	19 12 9		Tools	10 14 7	
		£2,366 15 10	Sundries ..	122 13 7	
Services—					£1,044 2 5
Hay pressing	454 7 6		Services—		
		454 7 6	Carriage of goods, &c.		134 8 9
			Labour (wages)		561 7 9
			Total		1,739 18 2
			Balance		1,081 5 2
Total		£2,821 3 4			£2,821 3 4

These transactions cover operations during a single financial year, viz., from April 1, 1901, to March 31, 1902, and do not include moneys received during this period in payment for services rendered or goods sold during the previous year; nor payment of accounts outstanding at the close of previous year.

From account of these transactions it will be seen that gross receipts for the 12 months ending March 31, 1902, amounted to £2,821 3/4, and the expenditure to £1,739 18/2; so that the purely cash transactions leave a balance of £1,081 5/2 in favour of the College. There is one item that requires some explanation. Opposite hay pressing we find £454 7/6. This sum represents moneys paid us by outside firms for whom we pressed hay. If it were all profit it would of course considerably modify our accounts. Out of this sum we had to pay for labour, repairs, binding, wire, &c., after deduction of which our profit on the concern was about £100.

I have hitherto referred to the balance as shown by the profit and loss account as the gross profit. I have done this because we are able to get at a net profit, by assimilating our conditions to those that more generally prevail. Our payments do not include the salaries of farm foreman and farm blacksmith; nor is there any account taken of rent of land, or interest on purchase money.

These sums to be deducted from the gross profit may be represented as follows:—

Farm foreman..	£120				
Farm blacksmith..	130				
Rent on 1,230 acres at 4/.. ..	246				
	£496	Gross profit	£1,321	13	6
			496	0	0
		Net profit	£825	13	6

This gives a net profit of 13/5 an acre on every acre of which the farm is constituted. It is idle to bring up the question that we do not pay for students' labour. We have to pay pretty high for the supervision of that labour, and for the losses, exceptional on an ordinary farm, which it constantly involves. In any case, if we include salaries of farm foreman and blacksmith, as has been done in estimating the net profit, a glance at the transactions will show that during the course of the past season the farm has paid in wages £811 7/. I think it would be difficult to find any other farm of equal dimensions—1,230 acres—that is in the habit of paying more.

I do not wish to leave the subject without looking at it from one other aspect. Professor Lowrie stated in August, 1901, that it was his opinion that money invested in land should return 16 to 17 per cent. This statement brought down on his head at the time a good deal of adverse criticism. The past season was very far from being a good one, and yet let us see how the farm transactions answered to Professor Lowrie's optimistic references to general farming in South Australia. In March, 1901, the net capital was £3,905 17/9, which may be supposed to be borrowed at 4 per cent. to work the place—i.e., £156 4/8½. If this sum be deducted from our net profit, £825 13/6, we get £699 8/9½ to represent net return on the borrowed capital, £3,905 17/9. This represents over 17 per cent. net on money on which 4 per cent. had been paid, after paying £811 7/ in wages on a farm, the total area of which was 1,230 acres, and 4/ rent per acre. It will be seen that even during a season below the average Professor Lowrie's predictions have been realized.

ROSEWORTHY AGRICULTURAL COLLEGE NOTES.

FARM.

By J. D. Towar, Professor of Agriculture.

The following notes relative to the varieties of wheat now growing on the College Farm are supplied by Mr. C. T. Jarman, farm foreman, under whose superintendence seeding operations were carried out:—

The usual experiment with varieties of wheat in plots, ranging from 1½ to 8 acres, is being conducted this season.

Seventeen plots have been sown with different wheats. Every variety was dipped for two minutes in a solution of bluestone, of 1 per cent. strength, and sown as nearly as possible at the rate of 60 lb. per acre. A difference of several lb. in the quantity per acre sown, being caused by unevenness in the weight and size of grain of the various samples. The seed drill was left, as started, right through, without altering the quantity drill, the seed for each measured plot being weighed before pickling, and any left after plot was finished carefully reweighed.

A rain of 1.60 in. on the 25th March starting quite a crop of weeds on the fallows, teams were kept going ploughing 80 acres of lea land, harrowing same, and scarifying fallows where most needed.

Sowing the varieties of wheat was started on April 21st, with the soil in splendid condition, as far as tilth was concerned (though, as after events proved, in face of the continued dry weather, a little too damp). Starting with the late wheats, and finishing with the early ones, the varieties were all sown by April 28th.

There was no rain sufficient to reach the grain until June 8th to 15th. The result was a very poor germination, except a few of the early varieties, which had a decided advantage over the late sorts in this respect. The late varieties were sown mostly on the stiffer clay soil, which may partially account for their poor germination.

The wheats which showed to the greatest disadvantage in this respect were Tuscan, Marshall's No. 3, Dart's Imperial, Defiance, Majestic, and Purple Straw.

Two of these—Tuscan and Marshall's No. 3—started so badly that to bring the loss (through their comparative failure) down to a minimum, about two-thirds of each plot was scarified up and re-sown dry, on the 24th June, with College Selection, an early variety, which has come through well, and at present looks as if the right course had been taken.

The other wheats which germinated badly showed but slightly the effects of the March rain, there being dampness enough to cause germination and growth in patches, and in others malting; while in places the soil was dry enough for the grain to lie until the rain in June, when it came up, thus making the field look very patchy.

Ten or twelve years ago the Flinty-grained Medeah wheat was grown here, and after several years of successive sowing, it seemed to become less vigorous and prolific, and for the last few years has not been grown.

This season it is being tried from seed purchased of E. & W. Hackett, Adelaide, and it is interesting to note that this variety was not in the least affected by the dampness which upset so many of the other wheats, and with the June rains the plants came through as thick and even as if just sown. The plot is looking well, though late for that variety.

The wheats which are the most forward at the present are College Selection, Early Purple Straw, King's, and Neumann's.

An interesting experiment, testing the efficiency of fertilizers of various sources and guarantees, is in progress. Little or no difference in the effects of the several manures are as yet apparent, though every manured plot shows a much more healthy and vigorous growth than the one unmanured plot.

The broadcast v. drilling experiment shows a much more even though less forward growth on the plot broadcasted than on the one drilled.

EXPERIMENTAL VINEYARD NOTES.

BY H. E. LAFFER, SUPERINTENDENT OF VINEYARD.

Owing to the lateness of the autumn rains, the work on the vineyard was much delayed. The showers which fell at the latter end of March were too light, and at the same time too early to enable ploughing to begin.

June, however, provided good soaking rains, and since then the first ploughing has been pushed on as fast as possible.

As the teams finished off, they were followed by hand hoes, breaking down the narrow pieces in the rows of vines. Similarly all trees are being dug around.

Various manures have been applied to vines, but superphosphate has been used principally.

One block of Shiraz has been divided into seven plots, and manured as follows:—

Plot 1. Sulphate of ammonia, 2 cwt.
Sulphate of potash, 2 cwt.
Super., 2 cwt.
Plot 2. Sulphate of ammonia, 3 cwt.
Plot 3. Superphosphate, 3 cwt.
Plot 4. Sulphate of ammonia, 3 cwt.

Plot 5. No manure.
Plot 6. Gypsum, 10 cwt.
Plot 7. Sulph. ammonia, 2 cwt.
Gypsum, 4 cwt.

Each of these plots is equal to about half an acre. The manure is in all cases put down in the deep central furrow of the row, but later on, during the second ploughing, sulphate of ammonia is put in by the vines. Pruning has been pushed on as well as possible, though there is still much to do.

The area now under vines totals about seventy acres, and in future the only planting done will be the filling of blanks. All young vines when planted are given a handful of super. This seems to enable them to get a very quick start in the spring, and to become well established before the hot weather sets in.

Parts of the vineyard yield an abundant harvest of limestone every year. During spare time this is carted off and converted into good serviceable roads. In the wine cellars time has been taken up in attending to wines, such as racking, blending, and the various little matters necessary to the welfare of wines.

Rainfall for July up to date has been three-quarters of an inch.

SHEEP AND WOOL.

By G. Jeffrey.

Arrangements have been made whereby I am to write a series of short articles for The Journal; and, seeing that the London wool sales have just closed, it appears to me an opportune time to put the market position of wool as clearly and concisely as possible before the farmers. I might say, to begin with, that I will not attempt to prophesy definitely what the future will be, because of all the tricky commodities which are regulated by the law of supply and demand, wool is about the trickiest. In fact, we sometimes are inclined to ask—"Does the law of supply and demand regulate the wool market at all." But, whatever the future may be, judging from the London cables and the interpretation given of them in this paper, the present position at any rate looks exceedingly healthy. The general rise appears to be about 2d. per ℔., and when it is remembered that 2d. per ℔. means quite 50/ per bale, the rise is undoubtedly a substantial one.

As to the future, without wishing to claim infallibility, I cannot help thinking that the present prices will be maintained, but should there be any change things point rather to an upward than to a downward tendency. The position of merino wool is exceptionally strong. To begin with cloth made from merino is for the moment fashionable, and has been so for some considerable time back. Added to this is the fact that trade, generally, has been very good lately, with the result that stocks of the raw material have been worked right up, and as there is only a comparatively small amount of merino wool available for the next London series (in fact the smallest amount available in September for many years past) it is not at all unlikely that prices for this class of wool will go higher. Of course the position is greatly strengthened by the undoubted shortage in the clip of the coming season, caused by the unprecedented drought right throughout the wool-growing centres of Australia.

The outlook for crossbreds, however, is not quite so healthy, because from all accounts the coming clip from Argentine (where it should be remembered that more sheep are depastured than are to be found in Australia) will be a very good one, and that there is little reason for doubting that the 40,000 bales held over from the present series to the next are chiefly crossbreds. However, the price of crossbred wool is yet a long way below normal, and with trade as good as it is, with merino wool at a rather dangerously high level, there appears little reason for thinking that crossbred wool will go any lower, while it is quite on the cards that it may take a rise at any time.

Apparently the only real danger in connection with merino wool is that on account of the scarcity prices may boom, and our experience of three years ago is too recent to be easily forgotten. What happened then may happen again; any commodity which rises beyond the purchasing power of the masses is bound to suffer thereby; but, all things being considered, we may reasonably expect that after the terrible financial disasters of three years ago, buyers will be able to keep their heads cool, and thus prevent anything like a repetition of the boom time referred to.

In this short article I have not gone into figures to show the statistical position of wool, but the facts alluded to are based on a very careful examination of all the figures available, and unless the unexpected happens, the farmers who are keeping sheep have every reason to expect good prices for the coming season's clip.

FARM HINTS FOR AUGUST.

By A. Molineux.

It is not wise to adopt advice to any great extent when the results may possibly prove to be disastrous. But when it is stated by a reasonably reliable person that a certain procedure has proved to be advantageous, it is really worth while to put the question to a test upon a moderate scale. A single test cannot be relied upon, because there may be conditions which may seriously affect the results. A test with seeds, for instance, may be affected one way or the other by age, time of sowing, climatic conditions, character, or preparation of soil, or other circumstances.

By many farmers in Australia, as well as in other places, and for a long time past, it has been proved that a light harrowing on a backward cereal crop has been highly beneficial. By some the operation has been declared to be injurious. The difference in result has most probably been due to the nature of the soil. On a poor, light, dry, or sandy soil the air can enter more readily than on one of a clay nature. Where the surface is caked and hard it is difficult for the plants to thrive, and a light harrowing will do good. Doubtless a few plants will be pulled up, but the tillering of the rest will amply compensate for the loss.

In the south-east and the hilly districts peas may be sown during this and next month. This crop will enrich the soil in nitrogen, fatten the pigs, and feed the sheep and cattle. Two bushels of seed will suffice to drill an acre of land in rows 18 in. to 2 ft. apart, and 1 or 2 inches deep. Superphosphate will probably be a help to the crop. The average produce per acre in Great Britain is 30 to 40 bushels of peas, and 25 cwt. of straw. Peas grow best on calcareous loamy, and sandy or gravelly soils recently limed, and will do on clays, especially if hoed once or twice whilst in early stages of growth. The best garden peas are grown where lime is present prominently in the soil, but heavy manuring is injurious to the flavour.

A few acres of fallow land—more or less, according to possible requirements—should be manured at once, and sown at the end of September with maize, sorghum, or other summer and autumn fodder crops. It will be risky to sow otherwise than in drills 2½ to 3 ft. apart—according to the kind of crop and nature of the soil; and during the growth of the plants the land should be frequently cultivated, in order to aerate it, to destroy weeds, and promote absorption of moisture from the air. These crops will be of most value during the early part of next winter, when green feed is absent, and dry feed scanty and with little nourishment in it. A silo should be filled also with some of it as a surety against lack of sufficient food for the stock. This will cost labour; but the labour will be well repaid in the insurance against starvation of stock.

There are many places where lucerne could be established if early night frosts did not kill the young plants. The old plants would not be injured by a moderate frost. Sandy land will in some cases grow lucerne, and one variety (medicago media) has been named "sand lucerne" for that reason. The common lucerne (medicago sativa) will grow well on deep, rich, alluvial soils, where water exists within 20 ft. from the surface, and it is possible that it would do well on a free soil where water is much deeper. If seed is sown early in September there is a chance that later rain will establish the plants—and the chance is well worth risking for several years in succession until success crowns the effort. The land should be deeply and thoroughly pulverized and levelled, the seed should be drilled in half an inch deep, then rolled to press the soil about it. Drills one foot apart. Twelve pounds of seed is enough, but some authorities would use up to 16 lb. Seed grown in New South Wales gives best plants.

Mangolds and beets should now be sown. One ton of small roots is worth two tons of large size. Sugar beets should be grown for cows, as well as for other stock. Beets and globe mangolds are best where the soil is shallow. They all do well on salty soils. If the land is well manured and deeply and finely worked all the better. Five pounds of seed is ample for an acre, and should always be sown in drills or rows. Three feet by 18 in. is about right for large mangolds to stand, and 2 ft. x 1 ft. for sugar beets. The plants must be singled, and they can be transplanted to fill blanks, if care is taken to avoid damage to the taproot, which must also be straight in the hole when replanted. Kainit and super are good manures for these crops. It is very necessary to keep the soil open and well broken between the plants. The Red Globe mangold is apt to run to seed; the White Silesian beet is rather a heavy cropper. When mangolds and beets are grown widely apart on rich soil they develop great size, but small roots are far more sweet and nutritious.

Broad beans do well upon clay soils of a calcareous nature. Old farmyard manure in plenty should be applied. Two bushels of seed will sow an acre drilled in rows 2 ft. apart. If tall sorts, sow wider. The plants should stand 6 to 10 in. apart in the rows. When they show well up the hoe should be put to work. It is best to sow table varieties, such as the Windsor or Mazagan. Beans are usually crushed for horses, and for fattening pigs there is nothing better. The straw is much liked by live stock.

Sunflowers are grown on thousands of acres in Russia, both as food for man and other animals, and for manufacture of oil. In Gippsland (Victoria) a large area is also cultivated for oil seed. Sow during this month in rows 30 x 18 apart. Use a potash manure. The small seeded sort is best for oil, because there is less "blanket" in it to absorb the oil when being pressed. The large-seeded black Russian is mostly used for eating. The oilcake is superior to rape, hemp, &c. The hoe is a great aid to development of the plant. Seeds very fattening, and must be used in moderation when fed to fowls, horses, &c.

Plant potatoes in rows 24 x 8 in., if the spade is used, or 36 x 12 in. if by plough. The field must be well prepared—not cloddy. Use seed about 4 oz. weight, cut in halves lengthwise—these will make two sets of 2 oz. each. White Elephant and Beauty of Hebron do best on the plains. Brown's River, Pinkeye, and Ash-leaved kidney are favoured in the cooler parts. Plant five inches deep, and do not hill up, but use the hoe often to let in the air and to destroy weeds. When the plough is used, the setts are put in each fourth furrow, and furrows are nine inches wide, and the field is harrowed directly the shoots appear. For table use, some excellent tubers can be raised by laying the setts upon the surface of well pulverized land, and then covering them with a foot depth of half - decayed litter. In the cool localities planting can be done up till the middle of October. If water is available on the plains, a good crop of potatoes is almost a certainty in summer.

For feed only it may be worth the trouble to sow some barley and oats on a few acres. This could be grazed by the poultry as well as by the other animals during summer and autumn in some localities. A little green food is conducive to health when the natural herbage is dry.

Sow a few parsnip seeds on a piece of deeply pulverized rich soil. If any manure is used, put it deeply down. Clay soil suit parsnips. Sow in drills 18 x 12 inches, and keep well hoed.

Carrots should be on lighter soil, in rows 12 x 8 inches. Manure should not be mixed with soil, but may be buried at bottom. The hoe should be frequently used.

When the lambs are weaned, put the ewes in a rather poor paddock to check milk flow. Castrate the lambs when a month old. Do not shear too early, as many sheep may be killed by late frosts.

Pen up pigs for fattening. Do not let them have any kind of green food, but give peas, beans, meal, crushed barley, milk in any quantity. It pays best to raise pigs up to 60 lb. quickly, and kill or sell them.

Pie melons, pumpkins, &c., should not be sown until all danger of frost is over. They will germinate when the regular temperature is about 70 deg. F. Plants should have abundance of room. They do well where there is plenty of well-decayed vegetable matter in the soil, and must be protected against being shifted by the wind. It is a good plan to sow some maize or sorghum widely apart amongst these plants, to prevent the shifting.

A well-made silage pit will last out several generations of farmers. Green fodder in the pit is safe against fire, and the silage is a sure safeguard against impaction and starvation. This is a good time to make a pit.

About the entire. A few shillings can be saved now by hiring the services of a weedy brute, whose chief value is in his hide; but many pounds will be lost in rearing his progeny and then selling it for dog's meat. The first prize country show horse is not always the best entire that can be hired.

LAYERING VINES.

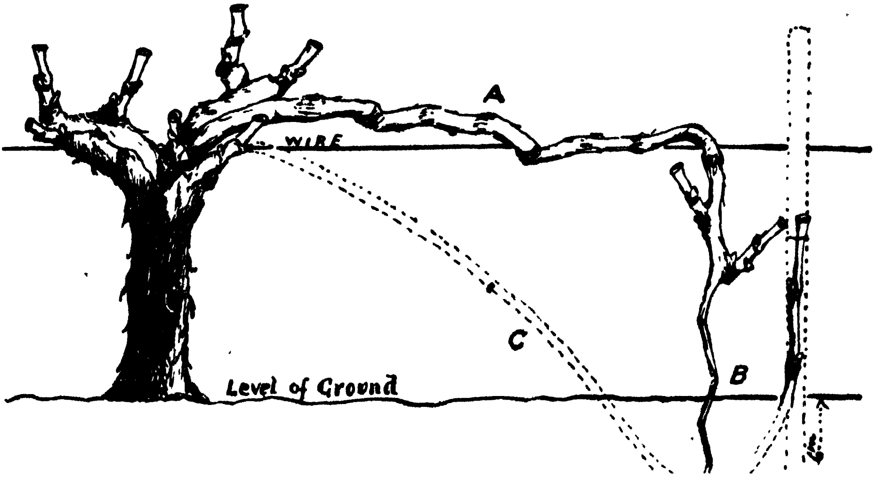
By Arthur J Perkins, Government Viticulturist.

In the May number of the Victorian Journal of the Department of Agriculture was printed a translation by Messrs. Dubois & Wilkinson of a chapter on Layering Vines, by Mr. G. Foex, formerly Director of the Montpellier Agricultural College. The task of offering criticism, however slight, on the work of one to whom I am indebted for my earlier training, and who has won world-wide recognition for his expert knowledge, is not by any means palatable to me. Personal experience, however, has led me to be at variance with the author on one point to which he makes reference, and in the interests of those who are likely to be influenced by it, I am bound to draw attention to it.

After describing three special methods of layering vines, the author proceeds to recommend, "as a method superior to any other," what the translators have called "reversed layering," and what is known to the French as "versadi layering." This method as shown in our illustration consists in leading the shoot to be layered overhead, instead of underground towards the blank, which it is intended to fill up; the shoot is then bent down, and its extremity alone buried in the soil. It will be seen that the buds will therefore be obliged to grow in the direction opposite to that towards which Nature intended them to grow. I do not refer to this fact as an objection, but merely as a matter of fact; practice shows that Nature is not very particular on that score, and well able to adapt herself to the change of conditions. The author goes on to say that rooting takes place within a year, and that the young plant may be severed the following year; the only objections that he finds to this system is that it renders cross-cultivation impossible, and requires a longer shoot than usual.

This strong recommendation of "versadi layering" by Mr. Foex, which I presume is endorsed by the translators, we find repeated by several French authors on viticultural matters. Relying on such authority, I have myself in the past been guilty of recommending this somewhat seducing system of layering. I must, however, confess that until recent years I have not had the opportunity of putting it to the test of personal experience. I have now tried it sufficiently frequently and widely to be quite convinced that under our conditions of climate it is quite useless, and to suspect that it would prove of little value, even in those countries where it has hitherto been recommended but not tested on a large scale, so far as my knowledge goes.

The only advantages that may be claimed for it, so far as my experience goes, are not referred to by the author. On this system a layer is less costly to establish and to sever from the parent plant; as, in place of a continuous trench extending from the parent plant to the blank space, it is only necessary to open out a small square hole. And further, contrary to Mr. Foex's opinion, it involves the use of a shorter shoot than common layering. The great objection to "versadi layering," however (and the author does not appear to be aware of it), is the fact that whereas that portion of the layer extending betwixt the parent plant and the shoots allowed to grow from the layer (A in illustration) increases in diameter, and grows vigorously; the portion extending betwixt the soil and the shoots remains weak and puny, frequently shrinking below its own original diameter; and this in spite of the formation of roots (B in illustration). Our illustration shows a Palomino Blanco, from which a "versadi layer" was made during the preceding season; the thickness of the spurs witness to the strength of the shoots. Note also the weakness of the stem below the spurs. I am obliged for this illustration to Mr. A. C. Smith, who sketched it from Nature. This is one example from about 50 that might be picked from the Roseworthy vineyards; in fact, so unsatisfactory have they proved that they will practically all be taken up and started on different principles.



Of course, such a system of layering admits only of application to trellised vineyards, where no cross cultivation is possible. The advantage of reducing the cost of layering by doing away with the continuous trench betwixt the parent plant and the blank may be retained by adopting the system which I have seen applied in Mr. Thomas Hardy's vineyards. The shoot to be layered is run along the wires, and only bent down into the ground in the immediate neighbourhood of the blank, and then bent up again, as shown in the dotted lines shown at C in our illustration.

I have never seen "versadi layering" applied in Europe, and do not wish to be understood to imply that I absolutely condemn it for countries where it has been recommended merely on the evidence of local experiments. I merely doubt that it has been sufficiently widely tested to merit being described "as superior to any other method," and I do not fancy that it will prove any more successful in Victoria than in South Australia.

Since writing the above Mr. Thomas Hardy has informed me that six or seven years ago he gave "versadi layering" an extensive trial on my recommendation. He reports that, as in my case, it proved a complete failure.

THE WINE INDUSTRY OF AUSTRALIA.

Compiled by Jos. Boothby, C.M.G., Statistical Office, Adelaide

Population, Census 1901.

Victoria	1,201,506	**Western Australia** ...	184,099
New South Wales ...	1,359,133	**Tasmania**	172,475
Queensland	503,266	**New Zealand**	772,720
South Australia ...	362,604		

CONSUMPTION.

Table showing the average consumption of Spirits, Wine, and Beer, per inhabitant of each State and New Zealand during the years 1898, 1899, and 1900 (Coghlan).

State.	Spirits.		Wine.		Beer, etc.		Equivalent in Alcohol (proof) per inhabitant.
	Total.	Per Inhabitant.	Total.	Per Inhabitant.	Total.	Per Inhabitant.	
	Galls.	Galls.	Galls.	Galls.	Galls.	Galls.	Galls.
New South Wales	951,548	0·73	858,477	0·66	12,446,932	9·58	2·17
Victoria	838,900	0·72	2,254,256	1·94	13,704,562	11·76	2·83
Queensland	444.772	0·98	249,622	0·55	5,278,665	11·58	2·64
South Australia .	141,057	0·39	815,633	2·26	3,224,124	8·95	2·23
Western Australia ..	268,363	1·85	155,062	1·07	3,453,343	23·84	5·24
Tasmania	66,658	0·39	15,842	0·09	1,238,155	7·33	1·37
New Zealand	470,132	0·65	104,043	0·14	5,900,349	8·18	1·75
AUSTRALASIA	3,181,430	0·74	4,452,935	1·03	45,246,130	10·48	2·41

ACREAGE UNDER VINES AND YIELD IN WINE, 1896–1900

	Victoria.		New South Wales.		South Australia.		Western Australia.	
	Acreage.	Gallons.	Acreage.	Gallons.	Acreage.	Gallons.	Acreage.	Gallons.
1896	30,275	2,226,999	7,519	885,673	17,950	1,743,090	2,294	—
1897	27,934	2,822,263	8,061	794,256	18,333	1,898,105	2,654	75,693
1898	27,701	1,919,389	8,083	864,514	18,761	1,263,998	2,960	89,099
1899	27,568	1,882,209	8,078	845,232	19,159	1,342,960	3,248	113,799
1900	27,550	933,282	8,278	739,668	19,438	1,558,285	3,325	86,801

SPIRITS DISTILLED, 1896–1900.

	Victoria.		South Australia.	
	Gallons. Total.	Gallons. From Wine.	Gallons. Total.	Gallons. From Wine.
1896	440,256	63,412	128,376	(Figures not yet available).
1897	422,133	58,265	149,448	
1898	432,462	70,191	94,045	
1899	491,305	32,159	123,302	
1900	469,671	32,060	122,212	

There are no distilleries in New South Wales. Vine growers are allowed to distil for fortifying wine, but no returns are published. In computing the quantity of wine utilised for the manufacture of spirits, five gallons of wine are estimated to produce one gallon of spirit.

EXPORTS.

Return showing the quantities of Wine, the Produce of the States of South Australia, New South Wales, and Victoria, exported, also quantities shipped, classified as below, for the years, 1896-1900.

Exports	1896	1897	1898	1899	1900	Total (5 years)
South Australia	Galls.	Galls.	Galls.	Galls.	Galls.	Galls.
to UNITED KINGDOM ...	302,119	433,012	429,507	410,145	386,986	1,961,769
New South Wales ..	6,235	4,860	7,976	4,742	4,796	28,609
Victoria	14,894	15,126	18,219	3,345	3,748	55,332
Queensland ...	3,796	5,489	5,408	7,186	6,082	27,961
Tasmania	1,482	1,286	2,271	3,410	3,550	11,999
Western Australia ...	33,476	21,382	17,612	17,331	16,585	106,386
Northern Territory...	1,844	1,893	2,067	2,295	2,244	10,343
COMMONWEALTH ...	61,727	50,036	53,553	38,309	37,005	240,630
New Zealand ...	17,105	23,094	20,289	40,983	39,759	141,230
Other Countries ...	10,282	7,572	10,716	7,073	12,896	48,539
TOTAL	391,233	513,714	514,065	496,510	476,646	2,392,168
New South Wales						
to UNITED KINGDOM ...	6,394	3,253	3,992	3,533	2,177	19,349
Victoria	5,636	7,846	3,745	13,503	3,221	33,951
Queensland ...	1,881	2,536	4,535	3,464	4,395	16,811
South Australia ...	—	4	20	4	—	28
Tasmania	121	232	534	749	238	1,874
Western Australia ...	1,899	1,719	745	30	26	4,419
COMMONWEALTH ...	9,537	12,337	9,579	17,750	7,880	57,083
New Zealand ...	1,934	2,364	4,469	6,702	12,820	28,289
Other Countries ...	6,312	5,982	5,002	4,764	5,447	27,507
TOTAL	24,177	23,936	23,042	32,749	28,324	132,228
Victoria						
to UNITED KINGDOM ...	328,651	298,937	202,920	310,963	359,867	1,501,338
New South Wales ...	956	669	990	1,063	943	4,621
Queensland ...	1,487	1,815	2,386	2,631	1,957	10,276
South Australia ...	152	12	186	170	27	547
Tasmania	1,496	1,387	1,627	1,375	1,309	7,194
Western Australia ...	8,483	7,228	3,596	1,945	1,434	22,686
COMMONWEALTH ...	12,574	11,111	8,785	7,184	5,670	45,324
New Zealand ...	3,120	3,262	1,839	3,681	3,561	15,463
Other Countries ...	10,016	9,826	8,366	6,004	5,985	40,197
TOTAL	354,361	323,136	221,910	327,832	375,083	1,602,322

IMPORTS.

Return showing the quantity of Wine imported into each State of the Commonwealth, and New Zealand, during the years 1896-1900.

	1896	1897	1898	1899	1900	Total (Five Years)
	Galls.	Galls.	Galls.	Galls.	Galls.	Galls.
New South Wales	94,446	97,416	96,601	103,587	93,717	485,767
Victoria	70,012	59,260	58,324	65,466	50,986	304,048
Queensland ...	37,104	43,674	42,351	61,664	53,815	238,608
South Australia ...	20,005	21,564	14,836	16,019	22,541	94,965
Tasmania ...	5,728	6,187	7,509	8,499	7,943	35,866
Western Australia	92,519	89,591	55,897	43,798	63,841	345,646
COMMONWEALTH	319,814	317,692	275,518	299,033	292,843	1,504,900
New Zealand ...	40,879	50,202	48,514	51,640	55,098	246,333
AUSTRALASIA ...	360,693	367,894	324,032	350,673	347,941	1,751,233

COMPARISON

of South Australian Exports of Wine to Australasia before and after Federation.

	Average Yearly Exports, 1896-1900.	Exports during 1901.	Exports during first six months of 1902.
New South Wales ...	5,722	28,687	26,284
Victoria	11,066	7,490	11.580
Queensland	5,592	14,497	14,996
Tasmania	2,399	8,589	3,217
Western Australia ...	21,277	17,472	7,701
To Commonwealth ...	46,056	76,735	63,778
To New Zealand ...	28,246	33,473	11,316
To Australasia ...	74,302	110,208	75,094

SPRAYING TESTS FOR CODLIN MOTH.

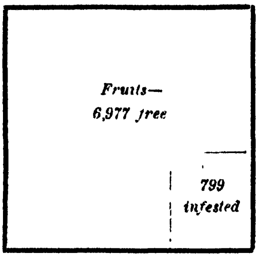
BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

The success obtained by some of our leading apple growers with the arsenite of soda spray against the codlin moth, and the projected demonstrations of its value to be made by this department during the coming season, has drawn considerable attention to the subject. Apart from these demonstrations many growers have signified their intention of giving the remedy a thorough trial. It may be of interest to many to know the exact results obtained by the department at Marion in 1897-8 with the arsenite of soda and paris green sprays, as compared with the rows left unsprayed but bandaged in the usual way.

The block of trees covered about 2½ acres. It was planted about 16 years before on the square system with 27 varieties of pears and apples, the trees being set 20 ft. apart. The sprayings were given at intervals of 14 days, beginning with the falling of the petals. After they had reached the size of a large grape berry the fallen fruits were collected twice a week from each row and examined with the utmost care. Where any doubt of the condition existed the fruits were cut up. As they matured, the ripened fruits were also carefully sorted. The sprays used were (1) paris green (arsenite of copper), showing by analysis 43 per cent. of arsenic. This was applied at the rate of 1 oz. to each 10 gallons of limewater, made by slaking 1 ℔. of perfectly fresh lime. (2) The arsenite of soda was made under Kedzie's formula, by boiling 1 ℔. of white arsenic and 2 ℔. of washing soda crystals in one gallon of water until a perfect solution was obtained. This was used at the rate of 1 pint in 40 gallons of limewater, made by slaking 8 ℔. of fresh lime. In each case the arsenites, after being liquified and dissolved respectively, were poured into a bucket of strong limewater half an hour before being put into the spray pump tank.

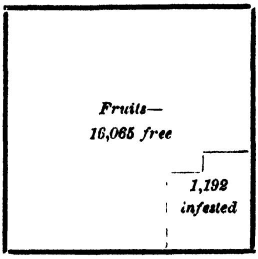
In the diagrams illustrating the results several differences are noticeable which require explanation. Group 4 sprayed seven times with paris green showed a heavier list of infected fruits than groups 1 and 3, sprayed four and six times respectively with the same mixture. The portion of the orchard of which group 4 was composed was only separated from very old, badly infested trees by a pathway on the northern and western sides. The rows sprayed with arsenite of soda showed to great advantage, more especially where they adjoined those left unsprayed. Although the sprayings were occasionally applied on very hot days no damage accrued to the foliage. This I attribute to the use of perfectly new quicklime, and the method of mixing the stock quantities of arsenites into the strong limewater for about half an hour prior to the full dilution to spraying strength. Fruitgrowers intending to make their own arsenite of soda will find an old kerosine tin a convenient and inexpensive vessel for boiling up the ingredients. The tin should be marked on the inside to show measures of one or more gallons prior to being used. This is necessary because moisture is driven off in the boiling process, and the solution concentrated. If when the dissolving process is completed the contents fall below the gallon, or whatever volume is desired, fresh water should be added to make up the deficiency. The grower should remember that accuracy in such details may make or mar the whole of his operations. A solution too strong will burn the trees, and one too weak will fail to attain the necessary end The use of absolutely fresh lumpy lime is essential, as severe burning of the leaves follows upon the use of even the moderately airslaked article. The vessels used in dissolving the arsenic and soda should not be put to any other use, and after handling the stock solutions—or even dilute ones—the workmen should wash their hands—more especially before eating. As the stock solution is practically colourless vessels containing it should be labelled in plain letters as containing poison, and be locked away from children and curious persons or strangers, who may mistake it for something quite innocent. I think 1 ℔. of fresh lime to each 10 gallons of water would prove sufficient to prevent damage to the foliage, more especially if the arsenite be mixed with the concentrated limewash. Some persons have used from ½ to 1 ℔. of molasses in each 10 gallons, and this may increase the adhesiveness of the spray, which is an advantage in wet districts. In such cases the slaked strong limewater should be treated with a solution of the molasses some time before the liquid is diluted to spraying strength. In applying the spray a light dressing is better than one which causes the liquid to run off very freely. The main object of the sprayer is to coat the fruits, and in doing this the foliage will receive quite enough. It is useless to spray with this mixture for codlin moth before the petals have fallen, and in practice it will be found that early setting kinds, such as the Jargonelle pear, will require to be sprayed quite a week before the general bulk of the varieties. The thorough application of two or three sprayings, beginning with the fall of the petals and continued at intervals of not more than 14 days, has been proved to be the most important. This is owing to the fact that pretty well all of the larvae which have hibernated (lived over the winter) about the orchard and open sheds emerge as moths during a period of four to six weeks from the fall of the petals.

DIAGRAMS ILLUSTRATING RESULTS OF MARION SPRAYING TESTS.



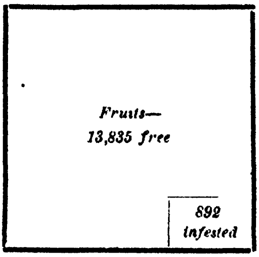
(1)

Two rows sprayed four times with Paris green. 89 per cent. free of codlin moth.



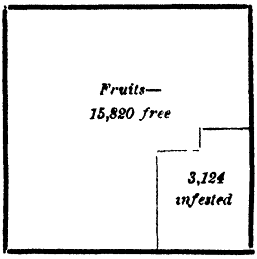
(2)

Four rows sprayed five times with Paris green. 93 per cent. free of codlin moth.



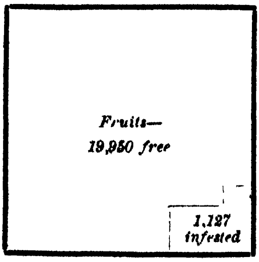
(3)

Four rows sprayed six times with Paris green. 94 per cent. free of codlin moth.



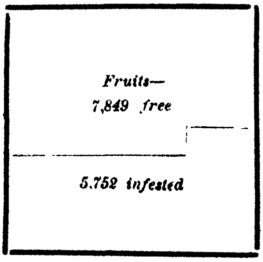
(4)

Seven rows sprayed seven times with Paris green. 83 per cent. free of codlin moth.



(5)

Four rows sprayed five times with arsenite of soda. 94 per cent. free of codlin moth.



(6)

Four rows not sprayed, 57 per cent. free of codlin moth.

In each case the square represents the volume of fruit (by numbers) from each set of tests. The proportions of clean fruits and infested fruits, respectively, represented by the divisions of the squares. Fractions are omitted in each case where the percentage of clean fruit is shown.

TOPPING TREES.

By Walter Gill, F.L.S., F.R.H.S., Conservator of Forests.

As the subject of topping, or, more correctly speaking, "pollarding" trees has frequently been referred to me for advice, a few remarks on this head may probably prove serviceable. The term "pollard" takes its rise from the fact that the head of a tree is cut off, or "polled," as a result of that operation, the object being generally that it may be induced to throw out branches and form a good head, when the previous growth of the tree has not been satisfactory in this respect.

The reasons for "pollarding" trees vary. In some cases the object is to reduce the height of a tree which, possessing naturally a tall, sparsely branched habit with little foliage, has run up too high and lanky, and from its liability to be broken by strong winds becomes a source of danger to buildings near it, or to pedestrians and vehicles passing under it. "Pollarding" properly carried out will very probably have the effect of producing a better head, and thus affording more shade, and giving a rather more ornamental shape, to the general outline of the tree, and it will certainly lessen materially the risk from falling limbs for some time, at any rate. It must be pointed out, however, that inasmuch as the cutting off the head of a tree is not a natural process, the new branches very often have a weaker attachment to the trunk than when growing in the usual way, as it often takes a long time for the bark and wood of the new limbs to become firmly attached to the section of the main stem at the point where it has been cut across. Hence it not infrequently happens that before the exposed surface is fully covered (as it will be in time if limbs are growing close enough to the cut to form over it), some of the limbs are wrenched off by strong winds.

The way in which both the bark and new growth in gums, red gums especially, will extend over old or partially dead burnt trunks damaged through storm or fire is at once a marvellous proof of the wonderful recuperative power of this genus, and also a most singular and interesting study for those interested in the development of wood growth. Instances of this kind are of common occurrence in any timbered country.

It is for many reasons, however, better when selecting trees for ornamental planting to get those which are generally known to possess timber tough enough to stand winds well, and also to have a dense shady crown, growing only to a moderate height. Then, if this be done, the subsequent trouble will be avoided, and no risk will be run as to any possible disappointment arising from the failure of a tree to grow again, or any future injury from storms. It may also be observed as an additional argument for the course recommended, that a tree of sparse foliage, even if "pollarded," and made denser for a time, will eventually tend to its old tall form again, thus necessitating a repetition of the "pollarding;" whereas a tree, the natural shape and habit of which is dense and rounded with ample foliage, will always maintain the same general outline under suitable conditions.

When trees, however, are planted on soil and under conditions unsuited to their requirements it often happens that they evince signs of premature decay, the most easily recognised of which is the dying off of the top limbs. Other cases occur where some, specially violent winds have committed sad havoc with many of the most important limbs of trees, rendering removal of the damaged parts absolutely necessary. Under these and similar circumstances, "pollarding" may be the means of renovating the tree for a considerable time. It will not require much reflection to see that the best thing with regard to the first instance referred to is to choose trees suitable for every soil and the climatic conditions connected therewith, and thus avoid the need for "pollarding" as a means of renovating sickly trees, rendered unhealthy through neglect of proper study of their special requirements.

Another occasion on which "pollarding" plays a most important and useful part is in cases where trees or shrubs are systematically cut either for the sake of their leaves and twigs as fodder for stock feed, or in order to get a supply of light firewood from their limbs. When a tree is planted for the shade it gives, the beauty it adds to the landscape, or the shelter it affords from winds, it is generally supposed that the planter desires that it shall live as long as it is possible for it to do so; hence any interference with its natural tendency to grow in its own proper form may rightly be regarded as an unwise course, calculated to shorten its life. In the cases now under review, however, the object of the planter is to make definite use of a tree for a certain given purpose, under a systematically arranged plan, by which he is prepared to sacrifice the tree's life at an earlier age than it might attain if growing under normal conditions, because of certain well ascertained benefits derived from the operations carried out. This is a perfectly valid course, against which no objection can be raised, always presuming that the work be intelligently done.

It is asserted by some writers on tree culture that the roots and branches of a tree correspond so exactly with each other as regards their associated functions that if a branch be cut off, the corresponding root dies as a natural consequence. That this assertion has no foundation in fact must be evident when it is remembered that if trees of certain species, such as willows, poplars, or gums, be cut down to the ground they will usually throw up a strong growth of young shoots from the stump. Under proper care and treatment, big timber can be procured utimately from these shoots by careful selection, which could not possibly happen if all the roots had died through the destruction of the trunk and head above ground.

As enough has now been said regarding the question of "pollarding,' viewed from its general aspects, it is proposed at an early date to give all necessary details regarding the most suitable time and conditions for the work, and also to indicate the best way in which the operations should be carried out.

THE TYPICAL ORCHARD, MYLOR.

By M. Holtze, F. L. S., Director Botanic Gardens.

In the annual report of the Agricultural Bureau for the year 1892-93, the General Secretary, Mr. A. Molineux, F.L.S., urged the Government to establish an educational orchard and vineyard under the charge of a competent director, which could be utilized for growing fruit-trees and vines under their correct names, and also for educational purposes. The matter was brought under the notice of the Minister of Agriculture by the Central Bureau in 1895, and finally the Hon. Dr. Cockburn approved of the recommendation for the establishment of a typical orchard. The Government at first offered the old Exhibition Ground for the purpose, but as in the meanwhile it was given over to the Agricultural School, it was proposed to select a suitable site in the hills.

This site was finally selected by the Hon. Sir John Cockburn, K.C.M.G., before his departure for London in April, 1898, and the clearing and preparation of the land commenced the next month. A block of about eighteen acres was cleared, grubbed, and prepared for planting during 1898 and 1899, and in August, 1899, the land was ready to receive the trees, which, in the meantime, had been prepared in a small nursery partly from scions, kindly presented by the Governments of New South Wales and Victoria to the Board of Governors of the Adelaide Botanic Gardens, under whose control the proposed orchard had been placed, and partly from stock purchased from the leading nurseries of England, France, Germany, and the Australian States. Further collections were added in 1900 and 1901, so that at present the number of sorts of all classes of fruits is more than 4,000.

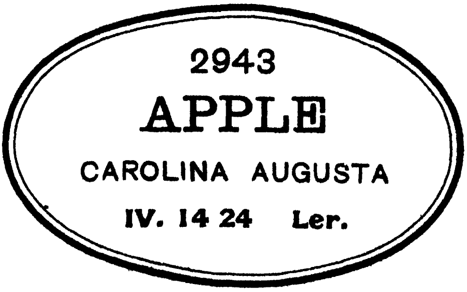
The site chosen is a block of brown land situated on the bank of the River Onkaparinga, near Mylor, and about four miles from Aldgate Railway Station. The block is a fair sample of the general qualities of the hills land. The orchard has an eastern aspect, and occupies a hillside sloping gently to the river, from which, in case of necessity, an almost inexhaustible supply of water for irrigation could be obtained.

The land occupied by the orchard was covered previously to clearing by a dense growth of stringybark and white gum. The soil on the hillside, like most of the soil in the hills, is of a sandy and stony nature, showing in places outcrops of soft sandstone, which had to be removed by blasting with dynamite. The subsoil, however, is of a better character; whilst a small portion near the river bank is of a black peaty nature.

The orchard has been very substantially fenced with barbed wire and vermin-proof wire-netting, and the improvements include two cottages, stables, cartshed, chaffroom, director's office, and large shed.

The laying out of the orchard and the labelling of the trees has been carried out in the following manner:—As it was desirable that no ground should be wasted, the trees were planted in rows twelve feet apart. Each tree forms the corner of an equilateral triangle, and is therefore the centre of a hexagon, each side of which is twelve feet long, so that every tree is exactly twelve feet apart from its six neighbours. The rows of trees run like the printed lines of a book, the first in order starting at the left-hand corner in each block, and subsequently following one another like a printed page. The various sorts have been planted alphabetically, and sufficient spare room has been left by the planting of duplicate trees all through the orchard, so that novelties for many years can be planted in their proper position. A great many of these duplicates are trees imported from Europe, and the correctness of their supposed colonial representatives can therefore be verified. The proper labelling of the trees has received particular consideration, and every effort has been made to render impossible the displacing of labels. Every plant in the orchard is provided with a zinc label, on which with platinum ink is written the class of the fruit, the name, and the place from where it was obtained. In addition to this, the label contains the number of the block, the number of the row in the block, and the number of the tree in the row. Besides this, there is a number punched in at the top of the label with half-inch numbers, by which the label could be identified in case the platinum ink should fade.

The labels correspond to an orchard list drawn up in triplicate, one copy of which is kept at the orchard, one in the director's library, and one in the herbarium. The labels are after the following pattern, but larger, being 5 in. long by 3¼ in. wide:—



2943

APPLE

CAROLINA AUGUSTA

IV. 14 24 Ler.

This shows the label is the 2,943rd consecutive label. Should therefore stand between 2,942 and 2,944 in the fourth block, the fourteenth row and the twenty-fourth tree. It is an apple named Carolina Augusta, and the sort was received from Andre Leroy, of Angers, in France.

Until the trees have borne fruit and are verified, we cannot of course guarantee the correctness of the sorts, but once this is done, there cannot be in future a chance of mixing the names, and it will then be possible for nurserymen and orchard owners to verify their own fruits.

As a matter of principle, to test the quality of the soil, neither irrigation nor manure has been used so far for the fruit-trees, and, notwithstanding the dry seasons which have prevailed since the orchard has been planted, the growth of the trees has been exceedingly satisfactory. This is particularly the case with apples, pears, plums, and cherries, as well as with all bush fruits; while for peaches, apricots, almonds, and all citrous fruits the climate of the hills is rather too cold to bring them to perfection. Many of the imported apple and pear trees are grafted on the French Paradise and Quince stocks, and the trees present, therefore, a more stunted appearance than their neighbours, which are grafted on apple and pear stocks; but, notwithstanding, they all present a sturdy and healthy appearance.

A large number of grafts of various fruit-trees have already been distributed from the orchard, as well as cuttings from the bush fruits; but as the trees, with very few exceptions, have not fruited yet, the director wishes it to be distinctly understood that so far the correctness of the names cannot be guaranteed.

A list of the sorts cultivated in the orchard will be published in The Agricultural Journal during the present year. For the present, it must suffice to say that the collection consists of the following sorts, of which, however, a number may prove to be only synonymous to others:—

Apples	1,417	Total brought forward..	3,648
Pears	946	Citrus fruits	66
Plums	384	Medlars	7
Cherries	205	Mulberries	8
Peaches	296	Olives	40
Nectarines	63	Currants	73
Apricots	112	Gooseberries	157
Quinces	26	Raspberries	55
Almonds	29	Blackberries	37
Chestnuts	12	Strawberries	163
Walnuts	12	Rhubarb	16
Persimmons	40	Vines	106
Loquats	8	Nuts and filberts	35
Figs	98	Various	8
Total carried forward ..	3,648	Total of sorts..	4,419

The expenditure so far has been £3,485 10/, and the present annual grant is £450. The staff consists of one senior and one junior gardener, local labour being employed as required.

[We propose at a later date publishing some photographs of Mylor orchard, which we hope will be of interest to our readers.—Ed.]

INSPECTION OF FRUITS AND PLANTS.

By Geo. Quinn, Horticultural Instructor and Chief Inspector of Fruit.

Under the powers conferred by the Vine, Fruit, and Vegetable Protection Act, 1885, and the regulations made thereunder, the introduction of all plants and fruits into South Australia by sea or land is controlled. No plants or portions thereof, or fruits, are admitted without first undergoing whatever inspection or disinfection is deemed necessary by the inspectors under the above Act. The introduction of plants—other than train or post parcels—which are all submitted for inspection by the customs postal authorities before delivery to the consignees—is only allowed via Port Adelaide. To overcome the difficulties experienced by importers in the south-eastern portions of the state, suitable disinfecting appliances have been supplied to the subcollector of customs at Serviceton. This officer, who is an inspector under the above Act, has been instructed in the work of disinfection, and all soft wooded plants intended for S.E. towns are dealt with by him. Trees and hard-wooded plants are sent on to Adelaide for treatment. With the exception of those grown in pots no plant is allowed to enter with soil attached to its roots. Grape vines and any portions thereof are absolutely prohibited from entering the State. In the rooms used by the department, disinfecting appliances are provided for the purpose of dealing with small parcels of plants introduced by post or rail. At Port Adelaide a large store is erected with a fumigating room adjoining. The necessary trays and appliances for effectively carrying out the disinfection of fruits and plants by the hydrocyanic acid gas process are provided.

With the exceptions of bananas, pine apples, and tree ferns, all plants and fruits are sent to this depot for examination. All citrus fruits, apples, pears, &c., are turned out of the import packages and examined. Citrus fruits coming from outside of the Commonwealth are fumigated in single layers on open trays before admission. The other fruits and cases are examined closely and disinfected whenever considered necessary prior to being handed over to the consignees. All fruit trees, and hardwooded trees, and shrubs are fumigated. Softwooded plants are rarely subjected to the process, but are carefully examined. This is done with a view to detecting any extraneous substances in or on which pests might possibly harbour.

By an arrangement with the Government of New South Wales citrus fruits from that State, carrying a certificate of official fumigation in Sydney, are passed on to Broken Hill, when the condition of all insects attached thereto verifies the declarations of the certificate. Such fruits—chiefly citrus—are not admitted for distribution in South Australia when dead scale insects are attached to them. This course is followed, because the insect most commonly found upon these fruits—the Red or Round Scale—is present in some of our citrus groves, and its distribution is prohibited by law. If these, with dead scales upon them, entered freely, they would become mixed with our own fruits, and as for some time the scale reveals no outward sign of having perished obvious difficulties might arise. In the examination of pine apples only a species of Dactylopius, or "mealy bug," is found, and as these do not prove serious outdoor pests here in our dry climate no action is taken. In the few cases of passion fruits imported we have never found any serious fruit pests yet. After making pretty rigid inspections for a long time it was found that no evidences of the presence of the dreaded fruit fly maggot of Queensland were ever found in bananas which arrived here in a green condition. Several years ago a few maggots were occasionally found in the ripe fruits. After several hundreds of cases were rejected each week on suspicion owing to ripeness, the exporters in Queensland settled down to send green fruits only. These, as far as we can detect locally, appear to enjoy a large share of immunity from the attacks of the pest, and such conclusions are pretty well verified by Queensland advices from persons who have observed the habits of the fly in that State. In consequence of this the bananas are now judged by their stage of ripeness, and examined accordingly with greater or lesser minuteness. By a temporary arrangement with the Governments of N.S.W. and Victoria, parcels of fruits and plants sent overland into those States are examined here by our accredited inspectors, and these are admitted on the production of such certificates of freedom from the diseases and pests prohibited by the Vegetation Diseases Acts of the respective States. This proves a great boon to the regular exporters of fruits and vegetables to Broken Hill. If no such arrangement existed the goods would have to be delayed and overhauled by inspectors at the New South Wales border. This side of the subject is often overlooked by some exporters, who complain of the irksomeness of the inspection here; but it requires very little imagination to foresee the effects of such a disturbing action on the produce if it were overhauled under the severe climatic conditions which prevail along the western border of New South Wales. This department, and the consuming public at Broken Hill, and the genuine traders and fruitgrowers in South Australia have reason to be grateful to the Government of N.S.W. for this privilege, and will act wisely in conserving it. The supervision of this work and the inspection of ordinary imports of fruits and plants via Port Adelaide occupies the whole of the time of one inspector. Those interested are charged fees, which are paid into revenue, as a contribution towards the expense of the work undertaken in their interests. Owing, however, to the unprecedented failure of our apple crop in the season just past, our traders have been compelled to import their supplies from Tasmania, from whence happily large quantities of excellent apples have been available. From July 1 to 25 2,292 cases of these apples have been imported. Practically no codlin affected specimens have been found, the season of that insect's activity being now over. The apple mussel scale is more or less prevalent among the consignments. The affected fruits are sorted and cleaned prior to going into distribution. A green caterpillar is frequently found, but as no moths have as yet emerged from the specimens secured, its identification is as yet incomplete. The Fusicladium is often present, and somewhat remarkable to relate—as far as our experiences go in this dry climate—the pustules are even now in an active state of growth, doubtless owing to the damp surroundings of the packed fruits. This disease being very amenable to spraying here no objection is taken to fruits affected by it. It may be of interest to note that these fruits are all spread out upon padded tables, and carefully examined individually for the various pests, the presence of which is suspected. To facilitate this work, and avoid damage as much as possible, the importers are permitted to send their experienced hands to assist wherever practicable. This privilege has been readily availed of, and with one exception, has thus far proved satisfactory to all concerned. During the month 71 packages of plants, 2,211 cases of fruits, and 1,333 packages of vegetables have been passed for interstate export. Eleven cases of fruits (bananas) have been refused admission for reasons given herein. During the same period 70 cases and packages of plants have been admitted from all parts, chiefly interstate, but some from European and American sources. This trade consists chiefly in fruit trees, young stocks for apple and pear trees imported by nurserymen, roses, carnations, azaleas, and heaths. These latter kinds are difficult to obtain locally, and consisted chiefly of new kinds. At the same time 3,523 cases of fruits were imported. The trade with Western Australia is not controlled in the same manner, but during the month little has been sent away. The locally grown supply of winter fruits is not large this year. Oranges are not plentiful, though apparently adequate to meet local demands. Lemons are not nearly as abundant on the trees as at this time last year, and soon as warm weather sets in the supplies will probably dwindle down rapidly.

ORCHARD NOTES FOR AUGUST.

By Geo. Quinn, Horticultural Instructor.

Excepting where water is available for irrigation during the summer, the season for setting out deciduous trees is now rather too far advanced in most localities. The pruning of peach trees should be completed this month, as the shedding of flower buds will be pretty well over. This is a vexed question, and the habit has been mainly attributed to certain varieties, more particularly the early ripening kinds. Personally, I am disposed to think that when our peach cultivators realize more fully the necessity for admitting abundance of light throughout every part of the tree during the whole of the growing period, we shall hear less of the trouble. The falling of the buds is obviously due to their immature condition. The securing of their complete development by a slow natural process will probably prove the solution of the difficulty. The formation of the flower buds upon the extremities of the annual shoots of the peach tree is, also doubtless, largely due to overcrowding of shoots and foliage, and the clouding out of parts below. Naturally the sap flowing most freely to the highest points well up in the light will tend to develop the flower buds on those parts when the rankness of full growth declines.

The appearance of small pale green tips of growth in the axils of the leaves of citrus trees is the signal that they are beginning to start into growth. To the average planter this indicates the time to transplant them. It is true, under great care in shifting, these trees may be successfully transplanted at any time in the year by a skilled man, but for the average planter the autumn and early spring seasons prove most suitable. Besides the necessary care and skill required, three important conditions are essential to successful citrus culture. These are (1) rich, well-drained soil, preferably of an alluvial nature; (2) effective shelter from rough winds of any description; (3) an abundance of moisture, chiefly in the form of water for irrigation. Without these it is almost hopeless to try to grow citrus fruits commercially. In selecting trees at the nursery take small ones, provided they are not made small by the stunting effects of having been worked on old stocks or moved previously in the nursery. Choose the young clean barked trees with stems about as thick as a lead pencil, and not more than 18 inches high. These as a rule may be lifted with most of the roots intact in the ball of soil. The young trees grown in a soil moderately rich in clay are more likely to lift with the earth adhering than those raised in deep alluvium. These latter will be big rank trees with a corresponding depth of roothold and a limited number of fibres. In lifting such trees the deep roots are lost, or if they are secured they prove practically valueless. Such trees, before being planted, must be root-pruned, and top-pruned in a like degree if the balance is to be regained, which is synonymous with future success. In this state citrus trees worked on the sweet and bitter orange seedlings have proved, thus far, more successful than those grafted upon lemon or any other of the citrus family. In planting put the trees well up on a mound, so that even after the prepared soil has subsided to its natural level the crown of the roots—that is, where they junction with the stem—will be above ground level. It is well known that these trees do not thrive when the soil is heaped around the stems. The addition of manure from time to time tends to raise the soil line upon the stems unless some such provision be made at the outset to keep them well up. It is true in free, well-drained soils these precautions may be disregarded with every appearance of immunity from "collar rot," but, in average positions they are worthy of consideration.

In the matter of varieties of the sweet orange the Washington Navel ranks first. The ordinary Australian Navel is a most unsatisfactory cropper. Malta or Blood, Siletta, Paramatta, St. Michael, Sabina, Oval China, Jaffa, Mediterranean Sweet, and Valencia Late, are probably the best of the varieties procurable locally. The Valencia will doubtless prove very valuable owing to its late period of ripening. Among the Mandarins The Emperor and Scarlet Emperor are imposing fruits, but quite unsuitable for packing owing to their puffy loose skins. Dancy's Tangierine and Beauty of Glen Retreat are more desirable, as they are solid well-flavoured fruits.

In the lemons the well-proved Lisbon is most valuable, though growers will do well to give the Eureka and the Villa Franca varieties a trial, as they may maintain their reputations for thornlessness under the conditions prevailing here.

The Bengal Citron, the Tahiti Lime, and the Poorman bitter orange are the best representatives of their respective classes for local planting.

Those who intend storing Lemons should look to the matter while the winter maturing fruits are yet sufficiently unripe. The best results have been obtained by cutting the fruits as soon as a normal size is reached, and just as the first faint flush of yellow begins to tint the skin. Cut them carefully with not sufficient of the fruit stalk adhering to prick the others when in the boxes. Place the fruits very carefully into the harvesting boxes, which may be ordinary fruit cases, and carry—not bump—the cases into a shed or room with abundance of ventilation passing through it. Allow the fruits to remain here for a period sufficiently long to allow the skins to lose their crispness. This will vary from a few days to three weeks, according to the atmospheric conditions prevailing. When wilted the fruits should be sorted over. Those showing blemishes calculated to go into active decay should be taken out and sold. The sound ones may be packed in trays holding a single layer, or in shallow boxes capable of holding several layers, but in the latter case some sort of separating partition should be used between the layers. An underground room—not too humid nor too dry—is best. The atmosphere in a room above ground level tends to become too dry, and causes wilting. On the other hand the subterranean store may readily become too damp, and favour rotting and the propagation of mould. In stacking the trays or boxes leave sufficient space between to permit the moisture to escape slowly.

Seedling citrus trees raised as stocks on which to graft should be set out into the open beds now. They must be handled carefully, and if the roots are much mutilated the tops must be reduced in proportion. These should be ready to receive inserted buds about February or March next.

Where the crop is removed the pruning of citrus trees should be taken in hand before much young growth is made. On old-established trees all dead wood should be cut out, and water shoots arising from the centre of the tree should be removed completely, unless any can be utilized to fill a gap in the contour of the tree. In young trees these rank shoots can be utilized to good purpose if they are bent down to fill vacant positions in the trees. It may be necessary to fix them by weights, but that is preferable to losing the balance of the head of the tree, which may result if they remain. It seems a waste of energy to remove them if they can be utilized. If the crowded and weakly terminal twigs of the orange, or the spindly laterals found choking up the interior of the lemon trees were removed, much good would be done to the fruit and to the tree. Such places are the chief refuge of scale insects, and vermin generally.

Those who plough their orchards twice will find this a good month to begin turning the soil back to the tree stems with a shallow furrow. In most of our districts the winter weeds will be buried with fair effectiveness, and most certainly before they have done much injury in dissipating the already too scanty moisture in the soil.

In some districts the grafting of old trees will be started. In this dry climate the bark or rind graft makes the least wound, and if the scions are put in three or four inches apart around large stocks the results will prove more satisfactory than when wide spaces are allowed to intervene. Should too many of them grow the surplus scions can be readily removed when a season's growth has passed, and the bark all around the stock will have been kept more active and healthy by their presence at the outset. The scions for grafting should be secured without delay and buried in moist sweet—not wet—sand or soil until required. The ripened young shoots of last year's growth make the best scions. Do not take them from rank unfruitful trees, or even from limbs that are not prolific in fruit-bearing on otherwise fairly good trees. The scion will reproduce the characteristics of the parent tree if the stock on which it is grafted be suitable.

Those who intend raising their own blight-proof apple stocks should lose no time in grafting the roots and scions of the blight-proof kinds, as the season is somewhat already advanced.

The spraying of various kinds of trees for the prevention of fungus diseases will begin during this month. The almond should have been treated ere this to check the shothole which affects the leaves so badly during some years. The most suitable time for spraying peaches, apricots, and nectarines with Bordeaux Mixture to check the curl-leaf and shothole fungi which attack them with such disastrous results is when the flower buds swell up and show the colour of the petals. The whole of the tree should be coated with the spray from the ground level to the topmost twig to ensure reaching all of the spores or germs of the disease. There are many formulae for making the Bordeaux Mixture, but its effectiveness probably depends more upon the proper preparation and application of the fungicide than upon the strength of the wash. Formerly I have recommended and used the 1—1—5 strength, i.e., 1 ℔. bluestone, 1 ℔. fresh lime, to 5 gallons of water, with success, but other reliable persons have used a 1—1—10 wash with equally good results, and, of course, at half the cost for materials. Whatever strength is used see that pure deep blue crystal bluestone is secured, and perfectly fresh lumpy lime only. In wet districts the addition of 1 ℔. of common salt or sugar, in solution, to the slaked limewater will cause the mixture to stick on longer. The bluestone should be dissolved either in boiling water or by being suspended in a barrel of water. This will keep unharmed for some time in solution. The lime should be slaked slowly with small quantities of water, and is best used within a few hours afterwards. After being mixed with the bluestone the wash should not be kept on hand more than a day or so.

The peach aphis will probably begin to give trouble soon, and if time is available a search should be made along the under sides of last season's shoots. As soon as found these pests should be sprayed or fumigated before the leaves unfold. The best spray for this pest is made from tobacco and soap in water—1 oz. strongest tobacco and 2 oz. soap per gallon of water boiled in the usual manner proves most effective. It only kills by contact, consequently the insects must be all reached by the spray.

The stems of trees in codlin-moth infested orchards should be scraped smoothly before the bark dries. All old stakes, posts, &c., should be removed and burnt if they stood beneath the trees during the past fruit season. If the storerooms are empty a thorough disinfection with the fumes of sulphur will prove useful in destroying many hybernating larvae, more especially if the room can be made absolutely airtight. This will also destroy the spores of mould fungi. Bandages that may have remained upon the stems of trees should be removed carefully and cleansed or burnt if too old and rotten for future use. The jagged ends left by broken limbs are favourite harbouring places for codlin larvae, and such should be sawn off smooth and close to induce complete healing of such wounds.

EXPORT OF PRODUCE.

Extract from report by Agent-General, dated May 30, 1902:—

Olive Oil.—I am frequently asked for olive oil, and although our prices are higher than the Italian I think a trade may be done, and a little expenditure is, I consider, warranted.

Apples.—After discussion with dealers at Covent Garden I have to report that cases containing "special quality" should be more distinctly marked, either by colouring or in some other style. If we can place a first-class article in the market, and obtain a reputation for doing so, we can subsequently introduce poorer grades, but only the best should be sent as South Australian. These, too, should be of even size; for if a dealer in opening a case finds an ill-assorted or poor lot he calculates on the fruit in the other cases being of similar character. On the other hand, should he be led into bidding too much by the first case being superior he loses confidence, and the growers eventually suffer. For a similar reason it is inadvisable to send apples injured by codlin moth. I believe that there is a great future for the apple growers in South Australia. I would further ask permission to suggest that some half-cases, made of the same length and containing several sorts of apples carefully packed, should in future be forwarded with each shipment for advertising purposes. The extra cost would be reimbursed to the seller by the extra price realized.

Pears.—These evidently either require a different sort of case, or the temperature has not been sufficiently well attended to. The pears by the Hector were over ripe, and the previous shipment was worse.

Grapes.—The bunches contain too many shrivelled and decayed grapes, and their appearance is not appetising.

From report by Mr. E. Burney Young, dated June 5, 1902:—

Wines.—During the twelve months ending April 30 we have sold 116,838 gallons of wine, making the aggregate sold since the starting of the Depot 558,173 gallons. The wines shipped to the depot have included many very excellent wines, and though the proportion have been wines of moderate price, these have been well-made, good, clean wines of their class. Some few shipments have arrived casky, and odd hogsheads of various shipments have shown slight caskiness. I cannot too strongly warn shippers to use the utmost care to ship in well-seasoned hogsheads, as it is impossible to get a wine really clean, however slightly tainted, and buyers become very suspicious of such wines.

Lambs.—The season's shipments were inferior in quality to previous years. Some good lambs were shipped and sold at fairly good prices, but many were very inferior, and have affected the average prices. Several shipments carried badly, and involved somewhat heavy claims upon the underwriters. The following are the average prices and relative charges:—

Ship.	Landed.	Quality.	Average Price per lb.	Total Charges per lb.
			d.	d.
Medic	November, 1901	1st	4·45	·38
		2nd	4·14	·52
Gulf of Taranto ...	January 14, 1902	1st	4·18	·39
		2nd	3·74	·38
Bungaree	January 2, 1902	1st	4.27	·33
		2nd	4.00	·34
Leitrim	January 14, 1902	1st	4.24	·30
		2nd	4 03	·29
Narrung...	January 20, 1902	1st	4·03	·32
		2nd	3·83	·29
Wilcannia	March 19, 1902	1st	4 31	·33
		2nd	4·10	·33

Fruit.—As the bulk of the shipments came to hand after April 30, I propose to write a special report upon the season's trade. But I may here remark that the first shipment, namely, the Sarpedon, was by no means a good specimen of

South Australian fruit. Many of the apples were too small for shipment, and the really fine fruit that usually characterises these shipments was conspicuous by its absence. The later shipments were an improvement, though some were too small. The packing generally was very good. The apples on the whole carried well, and turned out in good condition. A number of shipments of pears were also made, but the majority carried badly, and I am confirmed in the opinion that I have frequently expressed that pears should be carried at a lower temperature than apples in order to land them here in good condition. They would probably stand a temperature of 35 deg. F. or 36 deg. F., and unless they are carried at some such temperature the shipping of pears will always be attended with risk; they should also be well cooled before shipment. A few cases of Glou Morceau pears came in good condition per Orestes, and realized 20/ to 25/ per case, and 20 cases of Vicar of Winkfield 14/ to 18/. Two large shipments of grapes unfortunately turned out badly. As they were well and carefully packed, and came in the same steamer as a third consignment of 100 cases which turned out in excellent condition, I can only conjecture they must have been packed in too ripe a condition. I noticed the appearance of codlin moth caterpillars in some of the apples, though I am bound to say that not much notice is taken of it here. At the same time, if it become very prevalent, it would damage the sale of the fruit. Some of the authorities here prove that the pest can be kept in check by judicious spraying. The season has not been a particularly brisk one for fruit, owing doubtless to the extreme coldness of the spring.

Eucalyptus Oil.—203 cases were shipped. The quality was considered good, but stocks in London were heavy and the prices were ruling lower than last year, namely 11d. to 1/ per ℔., or about 3d. per ℔. less than last year. This is almost entirely a winter trade, and shipments should not be made until late in the year.

Poultry.—No shipments of poultry were made to the Depot last year. I am informed that paying prices can be obtained for good young poultry, well dressed, and shipped to arrive from February to the end of May or the beginning of June. It should be clearly understood that nothing but well-fed young poultry has any chance of a good sale.

Rabbits.—The season just closed has been greatly handicapped by starting with about 100,000 crates of old stocks on hand, but as this season's stocks have been practically cleared up it is thought that the outlook for next season is more favourable.

TRADE WITH SOUTH AFRICA.

Report from Mr. V. M. Newland, who holds an honorary commission to enquire into the prospects of trade between South Australia and South Africa:—

The trade in breadstuffs is so well established that there is little need for me to touch on the subject; the best known brands of the State are in good repute and find ready sale, as do compressed fodder, oats, oaten hay, &c., in the countries included in the South African Customs Union. The great drawback to an extensive trade in these latter articles in the Transvaal is the heavy duty imposed under the late administration—a duty not yet removed. This amounts to 5/ per 100 ℔. on fodder, and 10/ per 100 ℔. on oats; but in view of the desolated state of the country and the probability of the Transvaal joining the Union, we may hope for a relaxation of present stringent conditions. In potatoes and onions there is a wide field for enterprise, but until martial law is withdrawn and freer facilities for importation are available, the trade is extremely risky owing to delays at the various ports. On these articles the Transvaal duty is 7½ per cent., whilst in the Union an additional 1d. per ℔. is charged on onions. Butter is landed here from Victoria and New South Wales at about 1/3 per ℔., and New Zealand is also a keen competitor at about equivalent rates. The get-up and quality of these butters is beyond reproach, they being shipped in either 1-℔. pats wrapped in cloth or paper, or in tins. At these prices South Australia could, of course, not compete. I have approached representatives of various cold storage companies with regard to business in frozen lambs and rabbits, canned and frozen. In the majority of cases they have their own buyers in the various states of Australia. In canned rabbit, however, there is every chance of trade; but, in the absence of samples, I have yet done nothing in the matter. South Australian prices for canned beef and mutton are far above those of the sister states, and unless reductions can be made there is little chance of getting into this market, where competition is already keen between Australian, New Zealand, and American manufactures. In hams and bacon New Zealand is well to the front, and on prices quoted me by South Australian merchants there is nothing to be done. Both in the Customs Union and the Transvaal the duty on these is 7½ per cent. In jams the prices quoted me by South Australian firms admit of business, but the great drawback is that all samples submitted me are done up in 2 lb. tins, and for this size there is no demand. To enter into the South African trade it will be absolutely necessary for manufacturers to adopt 1-lb. tins; and in this connection it is well to note that numerous complaints have been made by merchants here that many of the jams from the other Australian States are done up in tins of 1-lb. gross weight, and charged as net—a mistake that South Australians would be wise to avoid. In making shipments of jams it is necessary to include a fair percentage of the small fruits, such as raspberry, strawberry, cherry, &c., as plain apricot and plum do not find too ready a sale. The duty on jam is 18/9 per 100 lb. in the Customs Union, and 40/ per 100 lb., with 7½ per cent. added, in the Transvaal. For canned fruits South Australian prices, as quoted to me, are just above the market; at something under 6/ per dozen 2½-lb. tins business, however, could be done. In quality and get-up the Renmark dried fruits compare favourably with South African products; but being subject to a duty of 2d. per lb. in the Union, and 3d., plus 7½ per cent., in the Transvaal, they are at a disadvantage; but, even so, there is a possibility of trade if manufacturers are prepared to accept, say, 5d. per lb. for dried apricots and peaches. To come to wines and brandies. For the former there is, I am convinced, a great future in this country, provided a demand can once be established. To do this the expenditure of a good deal of money will be required in advertising and introducing the wines. Even under present conditions prices allow of competition with the French vintage; but the matter is not so much one of price as of custom. At present every one drinks either French or Cape wines, and it will be a matter of some difficulty to turn public taste in a new direction. A good ordinary French claret, such as the higher grade St. Julien, is retailed here at about 45/ per dozen quarts; light white wines, not so much in demand, at equivalent rates. The greater part of the foreign wine is imported in bulk and bottled locally. The wine required is one not too heavily fortified, the French clarets most in use going about 14 per cent. Owing, however, to the great variations in temperature in this country nothing but well matured, thoroughly sound wine should be shipped. Burgundies and sherries both have their demand, and for good wines at reasonable prices there is a good opening. The percentage of spirit and age of wine should be stated in every case, buyers usually demanding these particulars. At present the Transvaal duty is only 7½ per cent., plus a transit duty of 3 per cent. through the countries in the Customs Union, but when the Transvaal joins the Union the duty on imported wines will be 6/ a gallon. In this connection it will be interesting to note what will be the result of the Conference of Premiers in London, as, should a preferential tariff in favour of the British colonies be approved the footing of Australian wines in Africa will be assured. It is therefore of the greatest importance to the Australian industry that no effort should be spared to obtain such a preferential rating, and it is to be hoped that all interested will give the matter their earnest attention. The prospects for Australian brandies are hardly so encouraging. The Cape "dop," as the local spirit is termed, is a grape brandy—hardly equal to Chateau Tanunda and other well-known South Australian brandies, samples of which have been sent me, but it is a sound spirit, cheap, and having the benefit of a difference of 4/ per gallon in duty as regards the Transvaal, where the tariff is 6/ per gallon on South African spirit, 10/ on foreign underproof, or 25/ on overproof. In the countries of the Union Cape brandy passes free of duty. In view of the possibilities of the South African markets, I would respectfully suggest that it might be worth the while of South Australia to devote a considerable sum to advertising and introducing the wines. That other Australian States recognise the value of the new market is evidenced by the appointment of well-paid agents at the various centres. An enterprising South Australian firm of soap manufacturers recently forwarded me samples of their products; in price they are able to compete with other firms represented here, and there appears a fair chance of doing business when the brand is better known. In the union the duty is 4/2 per 100 lb., and in the Transvaal 5/, plus 7½ per cent. South Australian olive oil is about equal in price, f.o.b., to the Continental, but freight is hardly so favourable, and it will be a difficult task to oust brands already well known. In conclusion there are several minor lines in which a small trade might be worked up; such as eggs in the cheaper months of the year, eucalyptus oil, honey, &c., though the duty on the latter article, 18/9 per 100 lb. in the Union, and 40/ in the Transvaal, precludes any large volume of business.

CORRESPONDENCE.

[In this column we propose to answer questions of general interest, and also to make selections from our official correspondence. Questions dealing with matters of interest mainly to the writer will be answered direct. Correspondence invited. Ed.]

GRAFTING VINES.

P. J. C.—Ans.: Most cultivated vines may be grafted one to the other; some white stocks have, however, not proved satisfactory for dark red vines. For instance, Shiraz grafts badly on Palomino Blanco. Although I have never tried them, I believe both Sultana and Zante currants would graft well on Shiraz or Carbenet. Try a few as an experiment before working over the whole vineyard.—[A. J. P.]

GRAPES FOR EXPORT.

P. J. C.—Ans.: The following table grapes may be recommended as fairly hardy, and of average good carrying qualities:—Daria, Muscat Gordo Blanco, Doradilla, Black Malaga. The following have fairly tough skins, but the bunches are more compact:—Red Prince, Grand Turk, Belas Blanco, and Crystal.—[A. J. P.]

CHERRIES NOT SETTING.

Amyton Branch.—Ans.: We are unable to say definitely whether defective setting on an isolated cherry tree should be attributed to want of fertilisation, as we are not aware of any special observations in the matter having ever been made. It is, however, a well established fact that most flowers are adapted by nature for cross fertilisation in some manner or other; and that, as a rule, the crossbred offspring are more numerous and vigorous than those resulting from self fertilisation. And, further, many plants are "self-sterile;" that is to say their own pollen is not capable, or only rarely capable, of fertilising their ovules. With such plants cross-fertilisation is a matter of necessity, and when absent no fruit sets. In this line cases are well known from certain varieties of apples, pears, oranges, almonds, vines, &c. We were not aware that cherries suffered from the same complaint. The mere failure to set fruit does not indicate want of cross-fertilisation; unfavourable weather or disease would act in a similar manner. We would suggest that during the present season portion of the flowers of the tree in question be dusted with pollen from another tree, and the results watched carefully and comparatively. You wish to know whether one tree can be both male and female. Certainly, in the sense that the same individual may carry both male and female flowers; or, as more frequently the case, hermaphrodite flowers, that is to say flowers with both male and female organs.—[A. J. P.]

PEACH APHIS.

D. M.—Ans.: A strong solution of tobacco and soap will destroy living aphis without any injury to roots or branches. Boil 1 oz. strong tobacco and 2 oz. common soap in 2 gallons of water until all the strength is extracted from the tobacco. The roots can be well cleaned in this, and no injury will result. It may not destroy the eggs, but I know of trees treated in this way before planting that have remained free from aphis, while those not treated and planted at the same time were badly infested. Fumigating with hydrocyanic acid gas before planting would effectively deal with both the living insects and the eggs, but the surface of the roots must be dry before treatment. —[G. Q.]

A POULTRY MANUAL.

By D. F. Laurie.

[Four or five years ago the department issued a bulletin on "Poultry Breeding," prepared by Mr. D. F. Laurie. All these have been distributed, and in response to frequently expressed desires for a revised and enlarged edition, dealing also with diseases of poultry, Mr. Laurie has consented to prepare the same. The articles will be published first in the journal from month to month, and afterwards reprinted in pamphlet form.—Editor.]

Shade, Shelter, etc.

As a rule, little consideration is given to the important question of shelter and shade when selecting the site for the poultry houses and yards. Poultry of all sorts seek shelter during cold, rough weather, as well as from the heat of the sun: to unduly expose the birds, and to subject them to the fierce heat of our summer sun is to court disaster. Theorists, lacking practical experience, will tell you that poultry roosting in trees are following nature, and are free from vermin and disease; they also show a great saving in the expense of houses, yards, and other accommodation. The birds which roost in trees, the hens especially, do follow nature, in that they do not lay during the cold weather, the reason being that all the food consumed is needed to supply animal heat, and no surplus is available for formation of eggs. Enlightened stockbreeders know that horses and cattle housed during inclement weather do better without food during the night than they do if well fed but exposed to the elements; it is the same with poultry, with this difference, that a very slight matter will cause hens to cease laying. As to the question of vermin, observations during a series of years disclosed numerous cases of wattle trees, olives, pepper trees, fig trees, fences, stables, barns, &c., becoming infested with vermin; in the case of tick, any treatment that would destroy them would probably kill the tree. Then, again, young stock if allowed to roost on trees, have the keel or breastbone dented and deformed; this militates against their sale as table birds.

In towns, where the houses are close together, the birds are frequently found living in a draught caused by the wind rushing between two buildings. Such birds cannot thrive, and disease is rife. Exposed plains, unless well grassed are not suitable, but if there are plenty of bushes or clumps of shelter at hand, the birds will thrive. There are many ways of providing shelter, the easiest being a three wire fence with brush thickly interwoven; there is, of course, a possibility of fire, but if these are placed well away from dwellings and poultry houses, not much damage can result. Other shelters can be made by driving a few forked sticks firmly into the ground, then fixing cross pieces, and covering the whole with cheap large meshed wire-netting, on which straw or scrub is laid, and held in place by wire or netting. These are excellent, and the birds will resort there readily in all weathers; the side exposed to the prevailing rough weather may with advantage be closed in. These shelters, which can be neatly constructed, must be kept clean, and should vermin appear must be removed, and the old straw burnt, and the framing well kerosined.

In laying out permanent poultry yards, especially where land is valuable and limited, the practice of planting fruit trees is to be recommended. While the birds may scratch the ground each time it is worked, they permit no insect pests, and there is a consideration in their manure. If necessary poultry could be kept out of a given portion when the fruit is ripening; they will eat grapes from the first formed berry onwards, so grapes and small fruits cannot be grown. Many trees of an ornamental character, and yet suited for shade or shelter may be grown. Among the most suitable, the following may be mentioned:—The carob tree (Ceratonia siliqua) is a fine shade tree, and planted 6 ft. apart makes a grand hedge; the isolated trees will bear beans after a few years, these, when crushed, make an excellent addition to the food for all kinds of stock. The tree thrives almost anywhere. Tree lucerne (Cytisus proliferus) grows quickly, makes a good hedge, flowers good for bees, and the seeds greedily eaten by poultry; stock will eat the young shoots; it is hardy, and suitable for dry country. The Buckthorn (Rhamnus alaternus) makes a good close hedge, but is slow growing. The olive makes a splendid hedge, but if planted at intervals in time will bear abundantly; the berries are much liked by poultry, and are very fattening. The African boxthorn (Lycium horridum) makes a close impenetrable hedge, shabby in summer, but green soon after first rains; bears red berries much liked by poultry, especially turkeys; grows well in sand, especially near the sea; the clippings are dangerous owing to spikes, and should always be burnt. Tamarisk (Tamarix gallica) is hardy and quick growing, makes a good hedge, and does very well near the sea. The pepper tree (Schinus molle) is admired by many; it is a shade tree, but the side exposed to prevailing winds is always shabby—should not be planted near gardens, it is one of the worst robbers of the soil. The quick growing creepers—Kennedya nigricans, Tecoma australis, and even Dolichos make excellent breakwinds if grown along wire-netting fences. Where shelter is available, and space unlimited, the colonies of birds may be at such distances apart as to obviate the erection of yards; however, where the stock has to be bred pure, the most secure yards are necessary. Portable houses are well suited for farms, and may be placed at intervals of a hundred yards or more round the homestead, and after harvest may be moved from place to place in the wheatfields to gather fallen grain and eat the seeds of weeds, &c. With a little attention each group can be accustomed to its proper quarters. A small portable yard is of use in confining a fresh lot of birds to a particular house; after about a week it may be dispensed with. It may here be pointed out that the absence of male birds, as will be emphasised later on, tends among other things to keep the hens to certain coops; it is the seduction of rival birds of the harem which causes hens to stray over the way.

The breeder who has unlimited range at command has little expense in fencing and wire netting; still his breeding yards have to be made. A golden rule to remember is that birds in confinement will thrive only if they have all the proper conditions complied with. Breeding stock especially must be well housed and attended to, for much depends on the stock bred from them, and, of course, sickly, ill-fed birds cannot breed good, healthy stock.

Having selected a convenient site, which should be well drained, and, if possible, naturally sheltered, the yards should be marked out, posts erected, and wire netting securely fixed thereto. Select a stout gauge of netting, and reject any inferior brittle rubbish; it is dear at any price, not being galvanized properly. Before unrolling, the roll should be dipped in a vessel containing 4 in. of tar; this part of the netting is buried in a trench running along the line of the fence, and 4 in. deep; it should be pegged down at intervals. Foxes may yet be a curse here—in Victoria the poultry fences are all 6 to 8 ft. high, and a wire tightly strained runs through the wire netting at ground level—this prevents them or other predatory animals from going under the netting. Where such precautions are not required the netting may be from 4 ft. high and upwards—many breeds are easily confined. If the posts are higher than the netting, it is a good plan to run two lines of fine binding wire above the netting. The birds can see the netting, but not the wire, and when they attempt to fly over meet with a rebuff, and they rarely persist.

No definite rule can be laid down to regulate the size of poultry yards, as this depends entirely on the individual breeder, as well as the class of soil. Avoid overcrowding. There are numerous glowing accounts of the numbers kept on so many square feet by some enthusiast, but the folly of such action is patent to any practical observer. Overcrowding stock of any sort causes the ground to become sick, as it is termed; that is it is saturated with excreta to such an extent that the occupants cannot thrive, and their weakened constitutions are easily assailed by the ubiquitous bacillus or microbe, and then disease appears, followed by disaster.

As a rule one cannot pick the exact soil to be desired, but where a slight sandy slope facing east, north, or west is to be had, combined with shelter, that is the ideal. Sloping land is better drained in wet weather, and much of the accumulated droppings are washed to the lowest part, whence they are more easily removable.

The wire netted fence satisfactorily erected, the gates must be so constructed that there is ample room for a barrow or vehicle for conveying food, &c.,

and removing manure. The gates should be provided with good hinges and automatic fasteners, and be self-closing. A handy man can make these of one-and-a-half-inch round timber. The struts and hanger must be well secured or the gate will sag. The hinges can be made as follows:—The bottom one a common pint bottle sunk in the ground; the top one a piece of quarter-inch iron or old fashioned fencing wire bent in a circle to fit the top of the "post," twisted and passed through a hole in the gate post and secured. Hang the gate askew, and it will close by its own weight. The automatic fastener is a piece of hoop iron, bent like a squat S, secured to the top of the post. When the gate shuts it depresses the hoop iron, slides over it, and strikes a piece of wood at the far side of the post, and termed a "stop;" as the gate slides over the hoop iron it is released, and springs into position in front of the gate so that till compressed by hand the gate cannot be opened. This is simplicity, cheapness, and security; money will permit elaboration.

Housings.

Fowl Houses.

A badly designed house is worse than none at all; it is marvellous how poultry exist and even pay under the most adverse circumstances. We must remember that we keep the poultry for profit, and to make that profit should be prepared for all reasonable provision which will add to the comfort and consequent productiveness of the birds. It is not the intention of the writer to give consideration to poultry houses of elaborate and costly construction; such are for the hobbyist, though by all means let those who have leisure construct everything about the farm in as attractive a form as within their power. One of the great drawbacks of our climate is the rapid multiplication of poultry vermin, of which there are several species, in addition to the dreaded poultry tick. For this reason we are compelled to avoid many materials in common use in other parts of the world. Vermin-infested poultry will not yield a profit, and, therefore, in constructing our houses we must reject all material in which they find a ready harbour, and use only such as will withstand, if necessary, the drastic recourse to fire. Galvanized iron, although the first cost may appear excessive, is the best, and should be the only material used in tick-infested districts. Construct the houses in the triangular or wigwam style, dispensing with the use of any timber except for the hanging perches. The mode of construction is as follows. Use 6-ft. sheets of galvanized iron, 24 gauge. For a breeding pen of about eight or 10 birds eight sheets will be required; for a flock of 20 layers 10 sheets are ample. Buy some small galvanized bolts, known as gutter bolts. Make parallel excavations about 5 ft. apart and 4 in. deep. Bolt the sheets for each side together; then to one side bolt a piece of ridge capping of the required length (this may be made of plain galvanized iron bent at a right angle.) Then after punching two bolt holes in each sheet of iron composing the other side of the house, place the sides in position in the trenches, bring them together at the top, punch corresponding holes in the ridge capping, and bolt the whole firmly. You will then leave a good space at the top for ventilation. Place one of the sheets at one gable end and cut it to shape at the top—the pieces cut out will fit in at the bottom of the triangle, and may be bolted or welted, and will then form the back. This is then bolted to the two sides, and your house is ready for the perches. These are of hardwood, 2½ by 1 in., slung on wires from the sloping sides, and stayed in position with fine wire, to prevent swinging. Narrow perches are not to be recommended—young and immature birds will get crooked breasts. Perches should be low, from 1 ft. for heavy breeds to 2 ft. 6 in. for the lighter ones. All perches should be on a level, otherwise the birds will crowd the highest point, and there will be much quarrelling. Make the perch suspenders with hooks, so that the whole is readily removable. Instead of sinking the iron in the ground the house may be secured by a loop of wire passed over it and through a staple on posts or pegs sunk level with the ground on each side of the house. Face the houses east, unless there are strong winds from that quarter.

Portable houses of identical structure are excellent. They are removed by placing a good pad on the head, enter the house, balance it, and walk to the required position (except on a windy day). Ruberoid is an excellent material.

cool when painted white, and very light; but it needs a lot of timberwork, and must be stretched over wire netting. It can be recommended to the careful, but so much timber offers a harbour to vermin.

Excellent houses of other design are to be built, but I am strongly opposed to low structures—they are very hot in summer, and icy cold in winter. Lean to and other shapes may be used where the tick are not prevalent, dressed hardwood well tarred and frequently soaked with sheep dip or kerosine may be used; but cracked or shaky wood should be avoided. The tick will infest a masonry or brick building, and are extremely difficult to destroy in such cases.

To those whose means are limited I can only say that the use of old bags, tins, boxes, bark, &c., means a premium to vermin breeding, and untold trouble in dealing with them. A structure of tarred bagging would do, but it would entail extra labour, and in the long run prove expensive and never satisfactory. Such are only permissible in making a start, or as a temporary makeshift, and their construction need not be considered.

Large houses are a mistake; do not build them; rather have a number of smaller ones. Poultry do best in small groups or colonies. Your breeding pens are always small, one male and so many hens and pullets. The laying flocks give best results when 20, or at most 30, are in a flock. Young stock must on no account be crowded—they require lots of room and air—overcrowding means stunted growth and sickly constitutions—failure in fact.

Nests may be made of kerosine tins cut in half lengthways, lined with grass or straw, which requires frequent renewal. They may be in the house, or, better still, in some secluded spot.

Study convenience—a busy man or woman wants to have houses and yards so arranged that they can be entered with comfort, and cleaned out with dispatch.

DUST BATH.

Poultry delight in a dust bath, and one should be provided for each group of birds. In a sheltered and rainproof position make a depression in the ground, and fill with road dust or dry pulverised earth, to which add a proportion of wood ashes, and a handful of flowers of sulphur; keep dry, and pass the materials through a sieve occasionally. The birds will rid themselves of any vermin, and during the moult the casting of old feathers and the growth of the new plumage will be assisted.

WATER.

A frequently changed supply of clean, fresh water is of first importance at all times, and the closest attention is required during the hot months. Patent fountains—purchased, or home made—are simply harbours for disease germs. Metal receptacles of any sort preclude the use of Douglas Mixture, or sulphate of iron, in the drinking water. The cheapest and most suitable water vessel I know of (I use no other) is a flower pot 8 in. diameter, or even less. Plug the drainage hole with a cork, and have a little post in the shelter, and fasten a loop of hoop iron so that the pot can stand therein, and not be upset by the birds. You can clean these pots easily, and if they become foul, placing them over a slow fire for a few minutes will cleanse them. They are cheap, and keep the water cool, and you have no metallic action if you use suphate of iron. The drinking water must be kept as cool as possible, and always in the shade. The shelter for this purpose may be small and neatly made of thatch, &c., say 3 ft. by 2 ft., which will also allow space for a shallow tin or trough containing a supply of hard, sharp grit, and also one containing shell, old mortar, old crushed bone, charcoal, &c.; these should be looked to at intervals, and be frequently renewed.

CLEANLINESS.

This ranks almost higher in the poultry scale than in the human; it is absolutely first. No accumulation of filth should be permitted; the droppings make valuable manure, and should be removed daily, and put aside. Rubbish of any sort should not be about; remove regularly. Limewash is healthy, and also destructive to vermin; it may be made of fresh lime, with the addition of a handful of sulphur to each bucket. Apply hot, and let it run into any cracks or joints. Apply whitewash every seven or 10 days, and at the same time remove all perches, and apply kerosine whether you notice vermin or not—prevention is better than cure. Where fixed houses are used, the floor must occasionally be removed, and a fresh lot of earth put in, and well rammed. The soil round the houses, the water shelter, and at the gates is soon saturated with excreta, and a few inches should be skimmed off with a spade, and removed to the manure heap. Add fresh soil if necessary, and sprinkle with slaked lime and ashes.

During the winter the yards become sloppy at times, also at the end of the summer with the early rains. At such times epidemics break out. Cleanliness, and the use of disinfectants ward off such disasters. The following may be recommended for spraying the houses, and for use with a watering can on certain parts of the yards:—Carbolic acid No. 1 mixed with hot water, 1 in 50; Little's Phenyle, Quibbell's Compound, Whalley's Fluid, Jeye's Fluid—as directed by maker. A very little goes a long way. Do not sprinkle unslaked lime in the houses or runs; should the birds eat it the effect will, as a rule, prove fatal—all lime must be well air-slaked and in a powder.

General Arrangement.

Space does not permit an extended review of different designs for yards and houses. A given square of land, say an acre, may have a square house in the centre divided into four compartments. By fencing diagonally four yards of equal area are obtained and conveniently placed for the houses; numerous gates are required. A circular house may be subdivided to a greater extent, and then all the subdividing fences will radiate from a common centre. There are objections to such schemes, the principal being spread of disease in case of an outbreak. Many prefer their yards and buildings in rows—single, or double, with a passage way between—from this all nest boxes are inspected, and all water supplies and food troughs attended to. Such schemes are more suited to the stud poultry breeder than to the ordinary poultry keeper. Naturally where much subdivision of the yards is necessary it is of importance to so arrange all matters, that labour and time may be saved, and arrangements must be made to suit the case in question.

Housing for ducks, geese, and turkeys will be considered in a later article.

(To be continued.)

Hares Gnawing Fruit-Trees.—Trees badly damaged by hares are not infrequently seen in the orchards in the hills. Sometimes the tree is completely rung, and much loss is sustained by growers. This loss can easily be prevented. If the stems are painted with a thick whitewash made of sulphur, and slack lime mixed with blood, which should be in "high" condition, neither hares nor rabbits will touch them. Dogs' dung and water, and, in fact, any offensive smelling mixture, will prove effective. It will be necessary to renew the dressing occasionally, but a little trouble in this way may save many trees. The first named mixture will last for several months on the trees, unless heavy rains fall. Wire-netting the orchard is of course the best remedy for vermin, but this is beyond the means of most orchardists.

Charcoal and Ashes as Condition Powders.—Comparatively few farmers and poultrykeepers seem aware of the value of wood charcoal and ashes as condition powders. For all classes of stock, for pigs and poultry in particular, they are invaluable. Keep a supply handy where stock can help themselves, and you will be surprised at the quantity they will consume.

Bonemeal for Stock.—One of the best preventives of digestive troubles in cattle is good bonemeal. Stockowners cannot have it too strongly impressed on their minds the imperative necessity for using only the right sort of bonemeal. Ordinary unsteamed ground bones are sometimes sold for the purpose, but experience in other countries has demonstrated that diseases of various kinds are communicated to stock in this way. For stock the bones require special treatment, and stockowners should see that they purchase their supplies from firms which pay special attention to this point.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Co. report on August 1:—

Unfortunately the hope that the outside agricultural and pastoral districts would receive a good subsoil soaking during the midwinter month has not been realized. A couple of light rains that did not extend much beyond Goyder's line is helping along feed, and also the young wheat plant in the older districts and the middle north; but prospects are not at all encouraging outside of these parts. There is yet time enough, however, if good rains should fall during August, some of the best wheat harvests recorded in this country having followed seasons when the rains came late. With pastoralists the outlook is from poor to fair, some places giving an average lambing, but returns generally are short, and a further reduction shown in the total number of sheep being carried in South Australia.

Business generally has been quiet, and until prospects in the country improve we must expect trade there and in the city to continue dull. No fresh developments to note in mining matters, though the Tarcoola Goldfield seems to be attracting the increasing attention of Victorian mining men.

Early in July the European wheat markets firmed up a shade, some Australian cargoes realizing 30/ per qr., c.i.f., United Kingdom. A drop of 1/, however, subsequently occurred, and at moment there is but little enquiry. Wheat reports from the Northern Hemisphere seem to be generally favourable, record heavy crops being harvested in Canada, and France this year reporting a surplus. Sydney, finding that she had overshipped, came on this market and secured all parcels of wheat offering, and then attacked Melbourne, buying largely there, shipments for which are now being made. These movements have caused an advance in interstate quotations of about 3d. per bushel in wheat; but as there is very little export demand for flour, millers are now offering at rates even lower than a month ago, when wheat was cheaper. Some mills are working short time; still stocks are accumulating. But it is not expected this will further depreciate prices, as in all probability most of them will shut down before many weeks. Advancing prices for millers' offal stopped export trade in bran and pollard, local demand absorbing all that was being made; and with the prospects of still shorter supplies, as mills cease operations, the market keeps firm for both at the advance established. In forage there is but little local trade doing, as growing feed, though late, is beginning to show up in most places. Export demand for chaff has been active, Sydney buyers operating heavily at advancing rates. Feeding grains are about as when last quoted, though business in the line is dull.

The local drop in price of potatoes that occurred when last writing had the desired effect of diverting buyers off the imported on to Gambiers, so that stocks are moving better since, but quotations have had to follow the downward trend that took place in interstate markets, but which seem now to be recovering, though it does not seem that very large quantities will have to be imported before our new locals begin to come forward. The city markets have been kept fully supplied with locally grown onions that have been well kept, and it looks as if enough are still held to fill all wants till new grown begin to come in. A little export trade is being done, chiefly from Mount Gambier, showing that in onions at least we have this season been able to meet our own requirements.

In dairy produce lines the increase in local supplies of butter continued throughout the month, so that importations for past couple of weeks have not been needed, but there is yet no surplus available, and the outlook does not favour the probability of a heavy export during the coming spring—in fact, the season looks much like being a very short one. Eggs show the usual seasonable increase in supply, but heavy demand from Sydney during July, in addition to Westralian and brisk local trade, caused price to again advance about 50 per cent., so that the month's average shows high, though the usual run-down is now evident. The extreme price of butcher's meat, including pork, has at last wakened up some bacon-curers to the fact that they have of late been operating at a loss, so bacon and hams have now advanced a penny. Cheese unaltered, but increasing demand may soon be expected. Honey is again moving more freely. Beeswax scarce. Almonds selling readily.

Carcase pork and veal have been selling at good prices, full catalogues at each Friday auction evoking keen competition for every line as offered. Considering the dearness of butchers' meat, it seems strange that poultry has during the past couple of months ruled so uneven—at times very low. This is accounted for by the large quantities of poor birds that have been persistently forced on the market, owing to the dearth and high prices of feeding stuff, with the result that even well-conditioned poultry, turkeys especially, suffered in price; but consumers are beginning to realize that these are relatively cheaper than beef or mutton, and prices for fit table poultry again show a tendency to improve.

MARKET QUOTATIONS OF THE DAY.

Wheat.—Port Adelaide shipping parcels, f.a.q., 4/2, f.o.b.; farmers' lots, 4/ on trucks per bushel 60 lb.

Flour.—City brands, £8 15/ to £9; country, £8 5/ to £8 10/ per ton 2,000 lb.

Bran, 1/4½; pollard, 1/5 per bushel of 20 lb.

Oats.—Local Algerian and Dun, 3/2 to 3/4; prime stout feeding, white, 3/6 to 3/9 per bushel 40 lb.

Barley.—Malting, 4/6 to 5/; Cape, nominal at 3/3 per bushel 50 lb.

Chaff.—£4 5/ to £4 10/ per ton of 2,240 lb., bags in, dumped, f.o.b. Port Adelaide.

Potatoes.—Tasmanian, £6 2/6 to £6 5/; Mount Gambier, £4 15/ per 2,240 lb.

Onions.—Local Spanish, £5 10/ to £6 10/; Mount Gambier, £7 per 2,240 lb.

Butter.—Creamery and factory prints, 1/4½ to 1/6; private separator, 1/3 to 1/4; best dairy and well graded store, 1/2 to 1/3 per lb.

Cheese.—S.A. factory, 6d. to 7d.; N.Z., to 8d. per lb.

Bacon.—Factory cured sides, 8d. to 8½d.; farm lots, 7d. to 8d. per lb.

Hams.—S.A. factory, 7½d. to 9d. per lb.

Eggs.—Loose, 11½d.; in casks, f.o.b., 1/1 per dozen.

Lard.—In bladders, 8d.; tins, 7d. per lb.

Honey.—2¾d. for best extracted, in 60 lb. tins; beeswax, 1/1½ lb.

Almonds.—Fine softshells, 5½d.; kernels, 9½d. per lb.

Carcase Meat.—Bright shop pork, 5¾d. to 6¼d.; useful stuff and nice baconers, 5d. to 5½d.; medium and rough choppers, 3d. to 4½d.; prime veal, 3d. to 4d.; poor and medium quality, 1¼d. to 2½d.

Dressed Poultry.—Turkeys realize 6½d. to 7½d.; fowls, 5½d. to 6½ per lb.

Live Poultry.—Nice table roosters, 1/8 to 2/1 each; ordinary conditioned cockerels and good hens selling at 1/3 to 1/7; a few coops of poor sorts, 10d. to 1/1; ducks, 2/ to 2/9 for prime; geese, 2/6 to 3/6; pigeons, 5d.; turkeys, 5¼d. to 6¾d. per lb., live weight, for good table sorts.

Above quotations, unless when otherwise specified, are duty paid values on imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In grain, chaff, and potatoes sacks are included but weighed as produce. Packages free with bulk butter and cheese.

DATES OF MEETINGS OF BRANCH AGRICULTURAL BUREAUX.

With a view of publishing in the "Journal" the dates of meetings for the current month, Hon. Secretaries are requested to forward dates of their next meeting in time for publication. The following have been furnished for this month:—

BRANCH.	Date of Meeting.	BRANCH.	Date of Meeting.
Amyton .. .	Aug. 14	Nantawarra	Aug. 13
Arthurton	21	Onetree Hill	15
Balaklava	9	Paskeville	16
Baroota Whim	16	Port Elliot	9
Booleroo Centre... ...	18	Port Germein... ...	16
Brinkworth	15	Port Lincoln	15
Burra	9	Port Pirie	23
Clare	8	Quorn	16
Crystal Brook	16	Reeves' Plains ...	15
Finniss	4	Richman's Creek ...	19
Golden Grove	14	Saddleworth	15
Inkerman	19	Stansbury	2
Kanmantoo	14	Strathalbyn	18
Kingston	2	Swan Reach	16
Koolunga	14	Tanunda	14
Lyndoch	14	Tatiara	16
Mannum	15	Wandearah	18
Meadows	18	Wilmington	13
Mount Remarkable ...	14	Wilson	16
Mundoora	15	Woodside	18
		Yankalilla	Sept. 5

MONTHLY RAINFALL.

The following table shows the rainfall for the month of July, 1902:—

Adelaide	1·41	Hoyleton	1·12	Meadows	2·97
Hawker	0·09	Balaklava	0·91	Strathalbyn	1·50
Cradock	0·03	Port Wakefield	0·87	Callington	1·13
Wilson	0·05	Saddleworth	1·56	Langhorne's Bridge	1·05
Gordon	0·04	Marrabel	1·46	Milang	1·40
Quorn	0·18	Riverton	1·49	Wallaroo	0·94
Port Augusta	0·11	Tarlee	1·43	Kadina	1·18
Port Germein	0·56	Stockport	1·08	Moonta	0·94
Port Pirie	0·73	Hamley Bridge	0·89	Green's Plains	0·84
Crystal Brook	0·78	Kapunda	1·87	Maitland	1·25
Port Broughton	0·95	Freeling	1·33	Ardrossan	0·79
Bute	1·02	Stockwell	1·73	Port Victoria	1·03
Hammond	0·12	Nuriootpa	1·64	Curramulka	1·88
Bruce	0·07	Angaston	1·99	Minlaton	1·89
Wilmington	0·74	Tanunda	1·81	Stansbury	2·00
Melrose	0·84	Lyndoch	1·77	Warooka	1·33
Booleroo Centre	0·43	Mallala	1·15	Yorketown	1·86
Wirrabara	0·99	Roseworthy	1·03	Edithburgh	2·13
Appila	0·76	Gawler	1·02	Fowler's Bay	1·16
Laura	1·29	Smithfield	0·91	Streaky Bay	1·96
Caltowie	1·27	Two Wells	1·15	Port Elliston	1·90
Jamestown	0·79	Virginia	1·07	Port Lincoln	2·04
Gladstone	1·01	Salisbury	1·20	Cowell	0·61
Georgetown	1·32	Tea Tree Gully	1·90	Queenscliffe	2·35
Narridy	0·85	Magill	1·85	Cape Willoughby	2·29
Redhill	0·92	Mitcham	1·69	Port Elliot	1·83
Koolunga	0·82	Crafers	3·35	Goolwa	1·79
Carrieton	0·14	Clarendon	3·84	Meningie	1·75
Eurelia	0·18	Morphett Vale	2·02	Kingston	2·54
Johnsburg	0·06	Noarlunga	1·64	Robe	2·54
Orroroo	0·23	Willunga	1·56	Beachport	2·02
Black Rock	0·14	Aldinga	1·28	Coonalpyn	0·93
Petersburg	0·29	Normanville	2·08	Bordertown	1·06
Yongala	0·40	Yankalilla	2·22	Wolseley	0·87
Terowie	0·51	Eudunda	1·30	Frances	1·19
Yarcowie	0·63	Truro	1·60	Naracoorte	1·67
Hallett	1·22	Mount Pleasant	2·09	Lucindale	1·93
Mt Bryan	1·15	Blumberg	2·17	Penola	1·87
Burra	0·85	Gumeracha	2·51	Millicent	2·21
Snowtown	0·85	Lobethal	2·54	Mount Gambier	2·23
Brinkworth	0·66	Woodside	2·31	Wellington	1·57
Blyth	0·96	Hahndorf	2·85	Murray Bridge	1·29
Clare	1·65	Nairne	2·62	Mannum	0·85
Mintaro Central	1·23	Mount Barker	2·88	Morgan	0·45
Watervale	1·55	Echunga	2·94	Overland Corner	0·32
Auburn	1·40	Macclesfield	2·76	Renmark	0·18
Manoora	0·89				

White Ants.—"Termites" attacking floors or posts can be very effectively combatted by the use of London purple or Paris green. Dust the poison lightly about the scene of their ravages, taking care that children cannot get at it. The termites, and ordinary ants as well, will lick their feet to remove anything that adheres, and so swallow the poison. The ants bury their dead by eating them, and so the destruction extends.

Wounds on Trees.—To induce rapid healing of wounds it is essential that the bark and cambium should be cut clean, an operation almost impossible of attainment with the secateurs. Where large limbs are removed, clean the wound with a sharp knife and paint it to keep out the wet, and also germs, which cause decay. Nothing is better for covering wounds than good white lead paint. It may be an advantage where the bark is likely to suffer from sunscald to cover the wounded limb with a piece of bagging.

AGRICULTURAL BUREAU REPORTS.

Hartley, June 21.

Present—Messrs. W. Klenke (chair), J. Jaensch, T. Jaensch, A. Thiele, W. Kutzer, H. Reimers, and B. Wundersitz (hon. secretary).

Improving the Usefulness of the Bureau. — Mr. Thiele read a short paper on this subject. He considered it quite time the work of this branch was improved. Members should attend more regularly, and take it in turn to initiate discussions on practical subjects. Some members seem quite satisfied to attend just sufficient meetings to retain their membership, thus receiving the Journal free, besides other advantages gained, while they give nothing in return. It was time the rules as to membership were altered, as they simply allow these undesirable members to remain on the roll. It was generally agreed that during the slack season meetings of the branch should be held more often, and that members should attend regularly, send in an apology when absent, or, failing that, they should resign. Fifteen members were considered sufficient for each branch; it was generally difficult to get as many members who will attend regularly. Mr. W. Klenke thought that members should make a practice of bringing forward any useful ideas or hints they come across, so that other members may have the benefit also. He mentioned that he found charcoal a good remedy for worms in pigs; an old chaffcutter knife fixed to a worn-out hoe makes an excellent implement. If the box of a plough wheel is worn out, get an old piece of mould board and bend it, and insert it in the wheel as a box; if the rim is worn out, put another band over it. All plough wheels should have dirtguards affixed; if the axle became worn, insert horsehair round it.

Port Pirie, July 19.

Present—Messrs. T. Johns (chair), T. Gambrell, T. C. Jose, T. Bell, W. Smith, F. Humphris, G. Hannan, H. Williams, E. J. Hector, G. M. Wright, J. Laurie, and T. A. Wilson (hon. secretary).

Programme of Meetings.—The hon. secretary was instructed to draw up programme of meetings for rest of the year, and to supply each member with copy, to do away with necessity for sending out postcards every month, and also to save the hon. secretary's time. Members suggested that it would be a good plan if branches were to adopt this practice generally. [Mr. Wilson urged the adoption of this system two years ago, and is doubtless pleased to have his members recommend it. From what I can see, one fault of the present system is the want of a definite programme of business at the bureau meetings. Of course if a programme is drawn up it should be carefully considered beforehand, and when adopted it should be adhered to unless special circumstances make it advisable to alter it. This might well be considered at the "Officers' Convention," to be held in connection with the annual congress in September.—Ed.]

Marram Grass.—Mr. Hannan tabled photograph of marram grass growing on the sand drifts at Port Fairy. He had secured a ton of roots and planted them on his land.

Chaff and Corn for Pigs.—The Chairman reported success in feeding pigs on hay chaff and whole corn. He mixed three parts chaff to one of grain together in a barrel, added a little pollard, then moistened the mass, and allowed it to soak for three or four days before feeding it to the pigs. Mr. Wright called attention to recommendation in The Journal of Agriculture to use wood ashes and charcoal as condition powders for pigs. Several members expressed their intention of acting on this advice.

Agriculture in South Africa.—Mr. R. J. Ferry, who has recently returned from the war in South Africa, forwarded a very interesting account of the agricultural conditions in the Orange River Colony.

One Tree Hill, July 25.

Present—Messrs. F. L. Ifould (chair), H. Blackham, F. Bowman, G. Bowman, J. Hogarth, W. Kelly, E. A. Kelly, M. G. Smith, A. Thomas, and J. Clucas (hon secretary).

Rabbit Destruction.—Successful trapping has very materially reduced the number of rabbits in the hills where the scrub burrows so plentiful on the plains are not frequently met with. Considerable discussion took place on proposition by the inventor of a new rabbit destroyer as to conditions under which a public test should be carried out. Mr. Hogarth agreed to make the test under the conditions approved of by members.

Port Lincoln, July 23.

Present—Messrs. W. Laidlaw (chair), J. D. Bruce, J. P. Barraud, J. C. Richardson, J. O'Shanahan, R. Sullivan, and Dr. Kinmon (hon. secretary).

Bureau Work.—Circular from Secretary for Agriculture discussed, members expressing their appreciation of the sentiments of same. It was decided to dispense with postcard notices, and send on date of meetings for insertion in Journal.

Die-back Disease.—Mr. Barraud stated that many of his apple-trees were dying back, the extremities of the branches becoming black and withered. Cutting the branches back did no good, and an application of super. to the soil, though lessening the trouble, had not stopped it altogether. Other members stated they found a dressing of super. mitigated the complaint. Mr. Barraud stated that the curculio beetle had been troublesome to his apple-trees.

Bute, June 17.

Present—Messrs. W. A. Hamdorf (chair), W. H. Sharman, E. Ebsary, M. Stevens, F. Trengove, S. Trengove, J. H. Brideson, F. Gitsham, A. Sharman (hon. secretary), and one visitor.

Weaning Foals.—Mr. Trengove called attention to error in report of previous meeting. He stated that he shut a foal up for six or seven weeks, not two or three weeks, and when let out it again commenced to suck the mare.

Rust-Resisting Wheats.—Mr. Ebsary stated that at previous meeting he expressed the opinion that rust-resisting wheats required less rain to bring them to maturity than soft wheats; in the report the reverse was said to be his opinion.

Best Means of Harvesting.—Mr. S. Trengove read a paper on this subject. He favoured the use of the binder and header, especially in rusty seasons. Last year they cut with the binder a piece of rusty crop, and let it ripen in the stooks. When threshed it turned out a good sample of wheat, but a crop of the same kind of wheat on same class of land, and sown at same time, which was left for the stripper, produced an inferior sample, there being 4 ℔. to 5 ℔. per bushel difference in the weights of the two samples. Mr. Ebsary made a similar experiment, and the result was a much better sample from the portion of the crop cut with the binder. Members were of opinion that Gluyas Early wheat was one of the best varieties to grow for binding, as it was very early, and did not shake out.

Cradock, June 21.

Present—Messrs. R. Ruddock (chair), R. Solly, A. N. Graham, T. Marsh, B. Garnett, W. Haggerty, P. Gillick, J. Turner, J. H. Lindo (hon. secretary), and one visitor.

Reel for Barbwire.—The Chairman showed rough sketch of contrivance for rolling up or unrolling barbwire, which was considered very handy, being easily and cheaply made, and could be carried by two men or a man and a boy.

Castrating Colts.—Mr. Gillick found a short rope for the neck, with a loop in one end so that it could be placed round the colt's neck and speedily tied to fit him, much better than a long rope with loop in centre tied with "boiler on the bite" knot to be slipped over the colt's head.

Manures.—Mr. Solly reported that he was trying experiments on his farm at Uroonda, with superphosphate for wheat crops. Mr. Turner reported that the total rainfall since January 1 was only 1.50.

Prolific Melons.—The hon. secretary reported that from a single plant of piemelon growing in an old dam he had gathered 135 fruits, weighing about 5 lb. each. Although the fruits were small, they were fully matured and of good quality. He thought the number of fruits must be something of a record for one plant.

Stockport, June 28.

Present—Messrs. G. Thomas (chair), F. Watts, A. Callier, C. Hartnell, T. Megaw, T. Howard, A. Bransom, J. F. Godfree, T. Hogan, J. Murray (hon. secretary), and one visitor.

Annual Report.—The hon. secretary read his tenth annual report, having been secretary since the inception of the branch. Nine meetings had been held during the year, with an average attendance of only six, a record which was not creditable to the members. Four papers were read and discussed, and the meetings on the whole had been fairly successful. The practice adopted of drawing lots at the beginning of the year to decide who should be responsible at each meeting for a paper or discussion has, on the whole, worked well, but several meetings were disappointing, owing to members whose turn it was to read papers failing to attend. It was resolved that the members hand in their papers one meeting ahead. Messrs. F. Watts and A. Bransom were elected Chairman and Vice-Chairman respectively, and Mr. J. Murray re-elected hon. secretary.

Fallowing.—Mr. Howard read a short paper on this subject. He believed in starting fallowing early, in June, if possible, and certainly not later than July. As soon as ploughing is finished run the cultivator over twice, as by working it well in this way the rubbish will germinate quickly, and can be fed off by sheep. By starting early it is possible to clean the fallow before seedtime. If the ground is clean it will not be necessary to harrow, and one turn with the cultivator will be sufficient. Ploughing 4 in. to 5 in. was deep enough in this locality. Do not work the ground when too wet, as the work will do you no credit, and it will do the horses harm.

Lucindale, June 21.

Present—Messrs. E. Feuerheerdt (chair), P. J. Robson, E. Tavender, A. Matheson, J. McInnes, A. Carmichael, E. E. Dutton (hon. secretary), and four visitors.

Manuring Grass Lands.—It was decided that Messrs. S. Tavender and A. Carmichael carry out experiments in the manuring of pasture land, under the supervision of the Inspector of Fertilizers. Each plot to be of one acre, and two different classes of soil to be tried.

South-Eastern Conference.—Correspondence from Millicent Branch was again discussed, but members adhere to their objection to the proposal to divide the district and have two conferences instead of one.

Central Bureau.—It was resolved that this branch places on record its appreciation of the good work of the Central Agricultural Bureau, and particularly the work done by the Chairman (Mr. Krichauff) and the General Secretary (Mr. A. Molineux).

Naracoorte, June 14.

Present—Messrs. S. Schinckel (chair), J. G. Forster, W. McKay, H. Buck, F. Welcome, P. Anderson, J. Wynes, G. Wardle, A. Caldwell, W. A. Terry (hon. secretary), and one visitor.

Deterioration and Improvement of Stock.—Mr. Forster initiated a discussion on this subject. He had noticed a great deterioration in horses in the south-east during the last 25 years. He enumerated the "E.S." and other brands of horses well known in the old days, and averred that they were far superior to the horses bred nowadays. They could stand any quantity of work, and were not easily knocked up. The horses bred nowadays could not stand much work. They were well enough to look at, but, as a rule, they had bad legs. To be good at all, horses must have good legs, or else they could not stand work. There was a good deal in the country horses were reared on. Horses reared upon stony country were the best, as it assisted to develop the bone and make the horse altogether more hardy. The Mount Benson Range was typical country for breeding horses, as was also Avenue Range. The greatest essential, however, was to breed from good stock, and he believed the stock they bred horses from at present was not nearly so good as in the old days. To his mind the horses bred now were in no way up to the horses bred 20 or 30 years ago in usefulness and hardiness. Their draught stock had also deteriorated very much. This applied to the whole of South Australia. He had seen some magnificent draughts between 20 or 30 years ago in the south of Adelaide, but at present they could not get a good draught. They had gone on deteriorating until they were now, they were generally, as bad as they could be. There were a few good horses about Mount Gambier, but there seemed to be a lacking of the qualities about them that made for strength. He saw a horse that £300 was paid for in Melbourne, and he wondered what qualities he possessed to warrant such a large price being paid for him. Still there was a praiseworthy attempt among a few to arrest deterioration in the breed of draughts, and they should be supported. At an Adelaide show one time a number of splendid draught entires could be seen, but now only one or two good ones could be seen. There had been a good improvement in cattle, especially in dairy breeds. There could be no doubt that great strides had been made in sheep breeding during the last quarter of a century. In the south-east it was most noticeable in the merino type. The weight of the fleece had gone up considerably, and quality had more than been maintained. He attributed in a great measure the first great improvement in merino sheep in the south-east to a Mr. Wade, who in the early days classed wool for Mr. Riddoch at Yallum. He laid the foundation of the Yallum flock. Then Hynam, Struan, and Moyhall followed suit. The four stations he had mentioned had undoubtedly splendid flocks of merinos, and they had great influence on the character of the merino in the south-east. They were examples of what influence such well-bred stock had in a district. Others had got hold of their stock, and had even improved them more. Mr. Buck agreed with a good deal of what Mr. Forster had said about horses, but it was not altogether the breeders' fault. In the early days they looked after their mares better; now they bred from mares in poor condition, and they could not expect to have good stock. They had to feed their mares, and also to see that their young stock had plenty of feed. In the early days there were some splendid stallions in the country, but gradually the stallions were getting poorer, until very few good ones were left. It seemed to him that the introduction of good blood in horse stock in the south-east had ceased for some time, except in a few instances here and there. The Chairman said he agreed with Mr. Forster in regard to horse stock, with the exception of ponies. In hackneys and draughts there had been a great falling off in quality, especially during recent years. He could bear out what was said about the "E.S." and other brands of horses bred in the south-east in the early days by men who had made a specialty of the industry. There were no such horses nor such breeders about the south-east nowadays. It seemed to him that those who kept blood stallions kept them to breed speedy horses, and they were not always the best for ordinary work. It was true that people did not pay enough attention to their brood mares. They were not fed, and the young stock were not attended to as they should be. The south-east was looked upon at one time as an important place for obtaining good horses, and owners being unable to resist the temptation for big prices for good mares they in time parted with the bulk of their good mares, with the result that the stock deteriorated. Breeders of horses would have to learn to keep their best mares to breed from them. The stations which had good flocks of sheep took good care to keep their best to breed from, and the same should be done in horse stock. Draughts had deteriorated very much. There was a marked improvement in the breed of cattle. He agreed with what Mr. Forster had said about the improvement in the breed of merino sheep in the south-east, but the most satisfactory development in sheep breeding in recent years was the manner in which the small owners had improved their flocks. No doubt they were influenced and assisted by the large owners. In reply to question the Chairman said the Government could license stallions that travelled or catered for general requirements, but they could not prevent a man from having a stallion of any description for his own use.

Rabbits and Foxes.—The Chairman read the following paper on this subject:—

> It is now twenty-five years or more since the rabbits first put an appearance in our district. Since that time many ways of exterminating them have been tried by different methods, both by private individuals and Government bodies, with the result that the rabbits gradually increased in such numbers as to almost take possession of the land. In fact I think I am right in saying that in some instances rough land has been thrown up on account of the rabbits being so numerous. So numerous did the rabbits get that it was quite a salvation to landowners and others directly or indirectly interested when the first phosphorized wheat and pollard were used, which the rabbits took so readily. They were poisoned in such large numbers as to make it very disagreeable to ride or drive through a number of paddocks owing to the strong stench of dead rabits. This wholesale poisoning of rabbits with phosphorized wheat took place about 12 or 14 years ago. Since then the rabbits have gradually decreased year by year, and now that we have a good market for them great numbers are being trapped for export or otherwise, which is a very good way of keeping them down in the breeding season, when they do not readily take poisoned baits. With the good system of poisoning and trapping the rabbits have now become so scarce that one very rarely hears or sees of any great destruction being done by them. Yet this wholesale destruction of rabbits is not all due to poisoning and trapping, as many thousands of young rabbits are eaten every year by foxes, which can easily be proved by examining closed rabbit holes, there being a small hole made right over the nest by the fox, and thereby getting the young ones. So many rabbits does the fox destroy that quite a number of landowners in the south-east will not allow a fox to be killed on their properties, with the hope that the fox will have every rabbit killed within his boundaries and save all his grass for his ewes and lambs and other stock. We must admit the fox kills a large number of rabbits, but there is another view to take of the matter. It is only a very few years ago since the fox put in his appearance in the south-east. Since then they have greatly increased in numbers, so much so that in another 10 years they will be nearly as thick as the rabbits unless united action is taken among landowners and other bodies to keep them within bounds. As the fox is on the increase, so the rabbits will decrease, and the fox finding a difficulty in rabbits for food, he must find other meat, which will be lambs and poultry. Of the former the fox has had a good number in our own district this year. If the fox is to have his liberty as some landowners (I am sorry to say) would like, I feel sure that in the very near future we shall find the fox to be quite as destructive as ever the rabbits were, only in another way. Not only will the fox be destructive to the sheepowners, but to the whole community, for the fox will destroy poultry, which is kept by nearly every householder. It must always be remembered that the rabbits can be poisoned in large numbers in summer without much bother or expense to any one. The rabbits also provide a lot of labour for men and boys in the winter months, when either rabbits or skins are sold. Now this cannot be done with the fox, as the carcase of the fox is of no value whatever, so we have only the skin, which will scarcely pay for the trouble of taking it off. The fox is also very hard to trap or poison. In conclusion I would say it will be better for every person to treat the fox as a dangerous enemy than to protect him. Treat him as a friend until such time as he multiplies and shows us his full powers of destruction, and it will be too late. Already this year I have found when going round in the morning several lambs with the tongue eaten. From 150 ewes he had now only 24 lambs.

Discussion.—Messrs. Forster, Wynes, and Wardle agreed as to the increase in numbers, and to the immense amount of damage being done by the foxes. That they killed large numbers of rabbits during the breeding season was admitted, but it was held that even now their depredations among lambs and poultry were of a very serious nature. If allowed to increase unchecked, because they helped to keep down the rabbits, they would soon find them extremely troublesome. Mr. Buck knew that foxes killed large numbers of rabbits, and they were particularly severe on the young ones, and in this way were of great use to the stockowner. He would as soon see the foxes about as the rabbits. As far as his country was concerned the rabbits were the worse. Foxes were poisoned more easily and also more cheaply than rabbits.

Telling the Age of a Horse.—After the meeting Mr. Forster gave a practical lesson in determining the age of a horse from the condition of its teeth. About half a dozen lads from the agricultural school were present, in addition to members, and Mr. Forster's explanations were much appreciated.

Richman's Creek, June 23.

Present—Messrs. W. Freebairn (chair), A. Knauerhase, J. J. Searle, J. McSkimming, F. Mattner, J. J. Gebert, P. J. O'Donohue, J. M. Kelly, A. Nicholson, J. H. Lehmann, J. McColl (hon. secretary), and one visitor.

Visit to Queensland.—Mr. O'Donohue gave an interesting account of his recent trip to Queensland. Generally speaking, the best lands seemed to be held privately, and new settlers require some means to start with to have any chance of success. He had not learnt anything new in the way of farming during his visit. Generally, the clearing of the land for wheat or other crops was costly, owing to the quantity of timber.

Woodside, June 23

Present—Messrs. R. Caldwell (chair), R. W. Kleinschmidt, W. Drogemuller, C. W. Fowler, R. P. Keddie, J. D. Johnston, G. F. Lauterbach, W. Rabach, and A. S. Hughes (hon. secretary).

Meeting of Branch.—It was decided that no subscriptions be made in connection with the branch, that each member read a paper in rotation, and that the public be specially invited to attend the quarterly meetings of the branch, when the papers read at the two previous meetings will be discussed.

Paspalum Dilitatum.- Mr. Rabach reported that while in Victoria recently he heard very favourable accounts of this grass for summer fodder. He had brought some roots back with him, and they were growing nicely. Mr. Johnston reported that he had a small plot of this grass doing all right.

Forster, June 24.

Present—Messrs. W. Johns (chair), A. Johns, F. Johns, F. Towill, S. Retallach, W. Sears, J. Johns (hon. secretary), and one visitor.

Officers.—Messrs. E. Schenscher, W. Johns, and J. Johns were elected Chairman, Vice-Chairman, and hon. secretary respectively for ensuing year.

Field Trial.—It was decided to hold a field trial of implements on October 15.

Mount Bryan East, June 21.

Present—Messrs. A. F. Pohlner (chair), T. Wilks, W. Bryce, E. Wilks, J. Thomas, J. Honan (hon. secretary), and one visitor.

Seed Malting.—The Chairman reported that wheat sown by him in March together with superphosphate had malted; a thunderstorm moistened the ground sufficiently to start the wheat, but the dry weather that followed killed it. Mr. Bryce reported that his wheat on black ground had malted.

Destroying Scrub.—Mr. J. Thomas, jun., reported on some experiments in this direction. He had cut down some scrub, and covered the stumps well with boughs, and no shoots had come up. Stumps only partly covered had grown again.

Quorn, June 21.

Present—Messrs. R. Thompson (chair), H. Altmann, C. Patten, T. Herde, J. Rowe, J. Cook, J. W. Smith, G. Walker, J. Brewster, W. Toll, and W. Noll.

Tomatoes.—Mr. Cook read a paper on growing tomatoes. He thought more attention should be given to the cultivation of tomatoes. They were easily grown in a sheltered spot, and nearly every householder could grow a few plants. The fruits were almost indispensable in hot weather. Efforts should be made to get early fruit. Sow seed in May, and plant out about end of June, sheltering them from frost. He had noticed "black spot" appeared to attack the early tomatoes worst. Another disease causing trouble was known as "false flowering." Even when the tomatoes are of a good size they become uneatable. He believed the cause of this was heavy watering following a period when the plant has suffered from want of water. In England tomatoes are grown in immense quantities in large glasshouses, and he believed they could be grown in this way all the year round in the north.

Elbow Hill, June 2.

Present—Messrs. H. Dunn (chair), J. Harvey, W. Ward, J. Wake, W. Spence, W. Tynan, G. C. Dunn (hon. secretary), and five visitors.

Selling Wheat.—Mr. Harvey read a paper on "Do Farmers get Value for their Wheat?" He pointed out that South Australian markets were 3d. per bushel under Victorian and New South Wales, while the standard in the latter state was ½ lb. per bushel lower than in South Australia. There might be a difference in freight and other charges between the two states, but not to the extent of 3d. per bushel. If farmers would co-operate they might get better value for their produce than they are getting. The Farmers' Union was not supported as it should be; it was, however, nothing but a joint stock company, as its share list was not restricted to producers. Farmers must combine if they wish to get the full value for their produce. By combining to send several parcels of high quality wheat to England they could settle for themselves the question as to whether over standard wheat should receive more than market price. He contended that all wheat should be bought on its merits. The matter had been discussed times out of number, and buyers made light of the subject, but most farmers held the opinion that, if wheat under the standard was to be docked, samples over the standard should command something extra.

Scales Bay, June 21.

Present—Messrs. J. P. Roberts (chair), G. H. Newbold, R. S. Thomas, A. Newbold, and four visitors.

Plump and Shrivelled Seed.—The Chairman asked whether shrivelled seed would remain in the ground without germinating longer than would fully developed seed. Members were of opinion that shrivelled seed required more moisture to germinate it than plump seed, and that should dry weather follow germination it would malt quicker.

Clean Seed and Experiments.—The Chairman reported that the seed received from the department for experimental purposes was in some cases very dirty, and he had to handpick it to clean it of drake and other foreign seed, of which he tabled a sample. Members were surprised at the condition of the seed, especially as it was supplied for experimental purposes.

[All the seed was purchased as "seed wheat" from members of the Bureau in different parts. Some of the members unfortunately failed to recognise the necessity for cleaning the wheat, and as the department had no facilities for doing the work it had to be sent out in the same condition as it was received.—Ed.]

Cutting Mallee Shoots.—Mr. Thomas asked when was the best time to cut mallee shoots, and how. The Chairman found July and August the best for old shoots, and August and September for first-crop shoots. Four cuttings generally killed the trees; it did not matter whether the shoots were cut with axe or billhook.

Ardrossan, June 28.

Present—Messrs. C. J. W. Freeman (chair), C. Dinham, J. Cornish, C. Cane, G. Wood, S. Alderman, D. Wilson, W. Lodge, and N. Opie (hon. sec.).

White Ants.—Mr. Freeman noted that white ants had been found attacking the green shoots from mallee which had been cut down. Members considered this proof of statements previously made by them that the "termites" occasionally attack living plants; they were specially active after rain.

Iron v. Timber Posts for Fences.—Discussion on this subject took place and the following estimates of cost of putting up a mile of fencing wire submitted:—

Iron posts, 12 ft. apart, 436 at 5d.	£9	1	8
Strainers, 20 chains apart, 5 at 2/	0	10	0
Four miles No. 8 wire	5	17	0
One mile barb wire	2	5	0
Cost of erection	3	0	0
Total	£20	13	8
Mallee posts, 436 at 6d.	10	18	0
Strainers at 2/	0	10	0
Wire as before	8	2	0
Cost of erection at 6d. per post	10	18	0
Total	£30	8	0

Not only were iron posts cheaper, but the fence was three times as lasting, and there was less liability to damage by fire. Members decided in favour of iron fencing.

Show Committee. A committee of three was appointed to enquire, particularly at next Adelaide Show, into (a), heading and winnowing machinery; (b), oil engines; (c), wire fencing. [A very good idea, which might be adopted with advantage by the branches.—Ed.]

Rhine Villa, June 21.

Present—Messrs. G. A. Payne (chair), H. Mickan, W. Farey, F. F. Payne, J. Vigar (hon. sec.), and one visitor.

Oats.—In reply to question members generally considered 60 lb. per acre of oats should be sown, as in this district oats did not stool out like wheat. Mr. Farey stated that with him oats ripened very unevenly. He asked which was the best variety to grow. The hon. secretary preferred Cape oats, as the straw after being stripped made a fair substitute for hay.

Manuring Grass Lands.—Most of the members thought it would be worth while to manure small paddocks, near the homestead, for early grass. Mr. Farey, however, thought the district too dry to get much benefit from the use of manure.

Millicent, July 2.

Present—Messrs. S. J. Stuckey (chair), H. A. Stewart, B. Varcoe, H. Warland, H. Hart, R. Campbell, A. E. J. Hutchesson, A. McRostie, and E. J. Harris (hon. sec.).

South-Eastern Conference.—Replies were received from south-eastern branches in reference to proposal to have two conferences in the district each year, but as there was only a majority of one in favour of the proposal it was decided to let the matter stand over for a time.

Annual Report.—The report showed that 11 meetings had been held during the year, the average attendance being nine. Mr. S. J. Stuckey and E. J. Harris were elected Chairman and hon. secretary respectively for ensuing year.

Tree Planting.—Mr. Campbell read a paper on this subject as follows:—

As the time is now here for planting fruit trees in this district, a few remarks thereon may help those putting some in. The holes for the trees should be dug to about the depth of the spade, leaving a solid block of earth where the tree is to stand. This should be pared down till the upper roots of the tree will be just below the surface or to about the "soil mark" on the butt. No air spaces should be left around the roots It is a good plan to put a bucket of water round the tree before the last of the soil is put in. but do not "puddle" it. It is also a good plan to dip the roots in a mudhole before planting Apples should be pruned hard back after planting [preferably before. —Ed] to a healthy-looking bud on each limb on the outside, leaving not more than three arms each [not more than four.—Ed.] nicely distributed. If the tree is more than knee high and vigorous and the limbs are not well balanced prune to a straight stem. This does not usually apply to two or three year old trees, but it may be safe even to do it in such a case. In nearly all cases pears may be cut to a straight stem, as they will shoot from almost any place on the stem, and the extraneous shoots can be rubbed off leaving three strong shoots. Peaches should be pruned well back and can be cut to straight stems if the tree will allow. Apricots make the best trees if served this way. If any should doubt it try it both ways, and the next time they plant they will have only one way, and that the straight stem. In Texas fig trees are cut down to the bare stump, and that planted just below the ground, and it is contended—as with straight-stemmed apricots—that they make by far the best trees served thus. Cherries are so liable to have their buds knocked off in transit that the best buds low down must be taken, but in no case should they be planted as received, as generally most of the buds on the outside are rubbed off. Plums can be treated as the apple or apricot. In the after life of the trees each tree needs about a separate treatment as to pruning, in accordance with its conditions of fruiting This is fully dealt with in Mr. Quinn's book on pruning, which can be had for 1/3, and which every person who has even only a few trees should have.

Lipson, June 21.

Present—Messrs. F. C. Potter (chair), Chas. Provis, H. Brougham, G. Baillie, J. Brown, A. B. Wishart, E. J. Barraud (hon. sec.), and several visitors.

Lands for Settlement.—Members recognise the importance of having the country to the north and west of the Hundred of Stokes settled, and it was decided to ask the editor to make it public through the Journal of Agriculture that the members will be pleased to do all in their power to assist farmers who intend inspecting the land, both by furnishing information and by obtaining horses and vehicles for visitors. Some discussion took place on the difficulties and delays experienced by farmers in this locality in securing wire-netting through the district council, and to the losses resulting therefrom.

Effects of Fertilizers.—Members were emphatic that the benefits from the application of super extended to the second crop, and that the heavier the dressing the more marked was the effect on the second crop.

Standard Sample of Wheat.—The hon. secretary reported error in report of meeting in June issue of Journal of Agriculture. The report should have stated that "the meeting was almost unanimous in favour of the Chamber of Commerce fixing the standard annually; one member, however, favoured a fixed standard."

Bowhill, July 5.

Present—Messrs. N. P. Norman (chair), W. Towill, J. McGlashan, S. Johnson, J. Waters, H. F. Baker, J. G. Whitfield (hon. sec.), and two visitors.

Poultry.—Mr. Towill referred to benefit he had secured from the occasional introduction of new blood, and also to judicious crossing of poultry.

Farming.—Mr. McGlashan read a paper on this subject to the following effect:—

One of the first essentials to success is suitable implements; we should have the best of each kind that we can buy. In this locality nothing smaller than a four-furrow plough should be used. We should look after our implements better; it is careless and wasteful to allow implements that cost us so much to remain under a pine tree, or, as some do, out in the open. Sheds of some sort should be provided, and all woodwork painted well at least every other year. The harness, too, should always be put under shelter. It should be kept in good condition, and not allowed to get into disrepair. We cannot depend on wheat growing alone. Keep a few cows and a separator. They will reduce the bills besides bringing in a little cash. Poultry can be made another source of considerable profit; it is not advisable for the farmer to go in for show birds, but it will pay him to get purebreds for crossing. A few pigs should be on every farm. A few vegetables should be grown for home use; by planting after the first rains we can raise quite a quantity of vegetables during winter and spring without irrigation and without much trouble. Every farmer should make a point of having a good stock of hay each year, and after getting it, he should be careful to cover it properly. My plan is to cover the stack with straw, and over this put wirenetting to keep the straw from blowing about, and also to prevent the fowls from scratching in the stack. I have used the same piece of netting for this purpose for 10 or 12 years, and it was as good as ever. The farmer should remember that the horse is his best friend, and treat him accordingly. When working him do not spare the brush, and, if possible, keep him free from sore shoulders. This is sometimes very difficult, but often it is due to want of a little attention. All cocky chaff and straw should be saved, and all the little things that go to making the farm a financial success should receive attention.

Officers.—Messrs. N. P. Norman and H. F. Baker were elected Chairman and Vice-Chairman respectively, and Mr. J. G. Whitfield re-elected hon. secretary.

Maitland, July 5.

Present—Messrs. A. Jarrett (chair), J. Kelly, H. G. Tossell, W. Wilson, E. Moody, O. Treasure, H. Bawden, W. Bowey (hon. sec.), and one visitor.

Farm Implements.—Discussion on this subject was resumed from previous meeting, nearly all the members taking part. Most present agreed that oil engines on the farm were a great acquisition, as there was so much work they could be utilized for. It was thought that if used for providing power for large winnowing machines, which would thrash the sheaves and clean the wheat, they would be more serviceable than the complete harvesters, as the wheat chaff, which was a valuable asset to the farmer for stock-feeding would be saved. The thrashing of the ordinary stripper might, it was thought, be improved. Mr. Moody defended the harvester. The one he had used gave great satisfaction, though there were several improvements that he could suggest.

Cleaning Land.—Mr. Tossell considered that the only effectual way to destroy weeds on heavy fallow soil was to use the paring plough; cultivators were effective on lighter soil, but the larger the implement the more land missed proper cultivation. He thought the cultivators could be improved upon by having longer sweeps in the tines.

Petersburg, June 21.

Present—Messrs. A. W. Jamieson (chair), J. M. Cadzow, H. Earle, S. Bottrall, J. Wilson (hon. sec.), and three visitors.

Standard Bushel.—The hon. secretary reported that he had procured an imperial bushel measure, and Mr. Cadzow had supplied a funnel for filling it in order to properly test the weight of wheat sold by members.

Wounds on Joints.—Mr. Earle reported that he had succeeded in stopping the flow of joint oil from wounds on horses by aplying carbolic acid diluted with equal parts of water. Mr. Symon applied paint and bandages.

Wallaroo Super.—Mr. Jamieson gave an interesting account of a recent visit to the Wallaroo Phosphate Co.'s Works, and described the process of manufacture of superphosphate. The hon. secretary also reported on a visit to these works. The manager informed him that he had experience in the manufacture of super. in England, America, and on the Continent of Europe before coming to South Australia, but nowhere were the climatic conditions so favourable for its manufacture as they are in this state. The manure can be made in such a dry state that no trouble is experienced by the drills clogging. The local manure being bagged only as required, the bags are naturally in good condition, and there was consequently no loss of weight through damaged bags.

Reeves Plains, June 20.

Present—Messrs. H. Day (chair), J. E. Dawkins, W. S. Corden, W. Cawrse, W. Day, E. Hancock, J. McCord (hon. sec.), and three visitors.

Sheep on the Farm.—Mr. Hancock read the following paper on this subject:—

Those of us who keep sheep know there is considerable profit in the business if properly managed. In my opinion the most profitable sheep to keep are breeding ewes. On an ordinary farm 100 to 150 can be kept. We will take the 100 for an example. Taking 80 per cent. of lambs at 8s. per head gives a return of £32. Then there is the wool. Take an average of 6 lb. a fleece, and we get 6d. per lb. This means 3/ a head more, or a total profit of £47. Regarding the best breeds for raising lambs for the market I find that the merino ewe and Lincoln ram progeny (known as the crossbred) crossed with the Shropshire ram will produce a lamb that will mature early and fatten on less feed. Although the crossbreds are good for breeding they have one bad point—they are fond of rambling, and covet the neighbour's feed, and get it, too, unless the fences are good. For clearing the land sheep are of good value. In the harvest time when one is busy and cannot afford time to work the fallow they will clear it of the weeds that the late rains have caused to grow; and they will eat any kind of weed almost. Every farmer should have some of his land sheep-proof fenced, if not all, for by having this he can keep a few sheep for killing, thus keeping the butcher from the door. Some tell us that they have not enough land to keep sheep. Not much land is wanted to keep a few ration sheep. Two or three small paddocks are quite sufficient to keep 20 or 30, and farmers would soon find it a great saving. I will put it this way. The butcher buys a sheep at, say, 12s., which weighs 50 lb., and he charges 4d. per lb. This come to 16/8, and the skin is worth about 2/6, so that the butcher has 7/2 for his share. And yet farmers could go into the market and buy equally as cheaply as the butcher. There is a great saving by keeping sheep on the farm.

Mr. Dawkins did not approve of the crossbred ewe recommended. The best, in his opinion, was the Shropshire ram, put to merino ewes, and then the ewes of this cross again mated with Shropshire rams. They were far before the Lincoln strains for early lambs. Mr. Corden agreed with Mr. Hancock. He found the lambs from this cross satisfactory. The Shropshire-merino cross was good, but the Shropshire rams were difficult to obtain. Mr W. Day had gone in principally for buying wethers to fatten and to kill for home use. He found a few wethers with the ewes tended to quiet them. He thought ewes better foragers and more fond of rambling than other sheep.

Renmark, June 19.

Present—Messrs. J. A. Forde (chair), C. Millar, M. Chapman, W. G. Moffat, F. Cole (hon. sec.), and one visitor.

Winter Irrigation.—The Chairman read a paper on this subject to the following effect:—

There is much diversity of opinion on the subject of winter irrigation. The following experiments carried on in the trying climate of Arizona, U.S., may be of interest. They were undertaken by one of the staff of the State University.—At the experiment station, near Phoenix, which resembles Renmark in dryness of climate, the soil is seldom wet to a depth of more than 8 in. by one downfall, and these are so infrequent that the soil becomes dried out between times. The orchardists depend on the rivers fed by the rain and snow on the distant mountains; but the water supply is much below their needs during the dry hot summer, when for four months the temperature ranges from 100 deg. to 115 deg. F. in the shade. The practice among fruitgrowers was to irrigate once a month (if possible) from early spring to autumn; their methods varied greatly, some ploughed temporary furrows 3 ft. apart, some used permanent ditches between the rows, and others flooded the entire surface. A few cultivated, but many allowed the weeds to grow, believing they sheltered the surface. Professor McClatchie, horticulturist of the station, set himself to solve the problem whether copious winter irrigation would not lessen the amount of water required in summer. The experiments were made on three-fourths of an acre containing three rows of peach trees and two rows of apricots, seven years old. The soil is a clay loam. Water was withheld from this plot from autumn till midwinter; during the next 12 weeks water was applied in furrows eight times, as soon as dry enough it was cross cultivated, ploughed deeply, and cultivated thoroughly. It received no irrigation until midsummer, and then but one, and no rain fell in the meantime. The trees grew vigorously season the irrigation was begun a week before midwinter and continued for 12 weeks Water was applied about as rapidly as the soil would absorb it, until 3 ft. in depth had been given. As soon as the soil was dry enough, it was ploughed each way about a foot deep, harrowed thoroughly, and left for the summer. After summer showers a cultivator was run over the ground to break the crust. The following summer proved the hottest and driest on record in the valley, yet the trees grew vigorously, and produced a good crop, and at the end of eight months, without water, looked well, while the trees in many of the orchards in the valley had died. These experiments settle the matter for the fruitgrowers in Phoenix; but there are not many plots in Renmark which would bear such an amount of water applied in a few weeks (supposing we could get it), as everything depends on the porosity of the subsoil; a retentive subsoil would have led to the total destruction of the professor's trees.

Johnsburg, June 21.

Present—Messrs. T. Potter (chair), J. R. Masters, L. Chalmers, J. Sparks, M. L. Read, J. Luckraft, P. Caughlan, W. McRitchie, F. W. Hombsch, and T. Johnson (hon. sec.).

Poultry.—Mr. Hombsch read paper by Mr. D. F. Laurie from Journal of Agriculture on this subject, and a discussion followed. Mr. Luckraft considered the cross between the Plymouth Rock and Minorca or Leghorn a good all-round fowl for farmers. Mr. McRitchie said they could easily effect a considerable improvement in the average run of farmers' poultry by procuring good purebred Leghorn or Minorca roosters occasionally. He doubted whether it would pay farmers to attempt to breed a bird combining laying qualities with meat production, as these two qualities were to a certain extent antagonistic. He would allow a vigorous rooster up to 20 hens. Mr. Masters said he had introduced purebred roosters to his hens with very satisfactory results. Mr. Potter favoured the White Leghorn. He tried Langshans, but they were too quiet, and not such good foragers. The farmer, if he goes in for both laying and table birds, must keep them separate.

Annual Report.—The hon. secretary's report showed that during the year ten meetings were held, with an average attendance of nearly nine members. Notwithstanding the very adverse circumstances they had to contend with, the work of the branch had gone on steadily, and the interest in the meetings well maintained. Five papers have been read and discussed, and generally the members have taken an active part in the meetings. Mr. T. Potter was elected Chairman, and Mr. T. Johnson re-elected hon. secretary for ensuing year.

Mount Remarkable, June 19.

Present—Messrs. C. E. Jorgenson (chair), W. Lange, T. P. Yates, W. Foot, J. B. Morrell, H. N. Grant, and J. O'Connell (hon. sec.).

Quantity of Seed per Acre.—Members were of opinion that according to the quality and class of soil from 30 lb. to 60 lb. of wheat per acre should be sown in this locality.

Fertilizers.—Mr. Lange thought that the extra cost of heavy dressings of manure was more than paid for in the increased yields. Mr. Jorgensen stated that he had this season sowed a few rounds at the rate of 2 cwt. per acre of super to empty the drill when finishing. On these patches the wheat was up, but on the rest of the field it had not appeared above ground.

Horsebreeding.—Mr. McIntosh read a paper on breeding and management of horses to the following effect:—

In selecting a stallion choose a big horse and a good worker, as our mares as a rule are already on the small size. Have plenty of action, and above all a good temper. A good draught horse should be able to walk and trot like a Shetland pony. All stallions travelling for hire should be compelled to produce a certificate of soundness from a duly qualified veterinary. They should be lightly worked when not in season, and receive careful attention in the matter of bedding and grooming. Change the feed as often as possible, and see that green feed is available. In choosing mares it is better to have an active mare with good action even if on the small size, than a larger mare with poor action. She should be short on the legs, with straight back and well-ribbed up, good tempered, and quiet. The mare can, if carefully handled, be worked up to within a few days of foaling; a foal from a working mare being better and healthier than one from a mare too fat. Mares with foals should be well fed; give boiled barley, good green feed and lucern, with as much green feed as possible. Handle the foals when young, as they become more docile, and there is less difficulty in break-them in. In breaking in a colt I would use my hands on him as soon as he is caught, go all over him with the flat of the hands, and be sure to lift each leg until it is given quite freely; rub well about the ears when taking off the bridle, and be sure to work as much on the off side as on the near. When catching always make him turn his head towards you by dropping the whip on his rump. Be careful not to get him sore. In mouthing use a thick bit but never rein up. The rest I would do by driving him with a couple of long lines until I feel his mouth is equal on each side. Do not ride or drive a horse out of the yard until it answers thoroughly to the bit. I would always ride or drive a colt the second day, and always give him plenty of time to know what he has to do. Many colts are spoilt by the too frequent use of the whip. I have always found it best to take a horse out of the harness if you want to flog him. In working horses avoid sore shoulders and back, and remember that prevention is better than cure Be careful to have horses in good health before starting heavy work, this may be done by giving a little boiled linseed with the food daily for say a month before hand. Always clean your horse well, and keep the harness and collars soft. I am a thorough believer in rugging working horses in winter, whether stabled or in the yard, and always brush well the shoulders before starting work. In heavy teams make every horse stand up to the collar before starting instead of every horse jumping into the collar at intervals. Every horse after he is 5 years old should have his teeth attended to, pulling out any loose ones, and filing the back teeth where necessary. If he is properly looked after a horse should be as good at 20 years old as he is at 10.

Members were of opinion that a good horse should be invited to travel the district, and should be guaranteed a certain number of mares at a given fee. Mr. Jorgensen fed his horses on chaffed hay, with a little common salt added, and they always look well, and ready for work. Water was laid on to the stable, and the horses could get it whenever they wanted a drink. Mr. Lange made it a practice to water his horses three times a day, as he had not been able to lay water on to the stable.

Morgan, June 19.

Present—Messrs. H. Hahn (chair), H. Wohling, A. Heinrich, E. Hausler, W. G. F. Plummer (hon. sec.), and one visitor.

Seeding.—Mr. Hausler read a paper on "The Best Method of Sowing Wheat, and How to Cover it." Without doubt the drill was the best implement for sowing the seed, but many farmers cannot afford the expense, and must either plough, harrow, or scarify the seed in. In sandy soil his experience was that broadcasting the seed and ploughing it under was the best. The mouldboards must be set in right position to turn every furrow even to secure satisfactory results. Seed should be covered 2½ in. to 3½ in. deep in stiff soil, and up to 4 in. in sandy soil. If the plough turns the ground well there will be very little seed left on top. In sandy country he had always found that if they got much wind a lot of seed gets uncovered when only harrowed or scarified in. Mr. Heinrich said if wheat was ploughed too deep in dry seasons it would not germinate. Mr. Wohling considered that every harrowing given to a crop meant an increase of 1 bushel to the acre in the yield. Mr. Hahn found that if sandy soil was harrowed too much the seed was uncovered.

Horses' Teeth.—Mr. Hausler wished to know the best way to remove a "bucktooth" from a horse. Mr. Hahn suggested filing it down. [What is a "bucktooth?"—Ed.]

Tatiara, June 21.

Present—Messrs. W. E. Fisher (chair), P. Low, H. Killmeir, and T. Stanton (hon. sec.).

Shrivelled Seed.—Mr. Low initiated discussion on question of sowing shrivelled seed wheat, and mentioned that as a trial a neighbour sowed in a box 50 shrivelled seeds, and 48 of these grew. [Under favourable circumstances, shrivelled seed will germinate and do well, but under average conditions it is unwise to sow such seed if plump grain is available.—Ed.]

Yarding Lambs.—Mr. Low read a short paper on yarding lambs for marking. He had often noticed flocks of lambs and ewes yarded with considerable difficulty, owing to the lambs breaking way. This was not generally the cases with small lots, or farmers' flocks, as they are quiet, and, as a rule, used to the yard. With larger flocks of 500 or more, and the lambs strong, difficulty may be experienced. It is best to muster them as early as possible in the paddock, as then the lambs will drive better with their mothers. Make as little noise as possible, and keep all dogs away. A dog that works without barking may, however, be useful to turn the lambs now and then when inclined to break. On nearing the yard, cut off a hundred or so of ewes and lambs, and allow a man and a dog to yard them quietly When this lot is yarded, cut off another lot. The first lot in the yard will help to draw in the others. If any lambs break away, call off the dog, and the chances are the lambs will follow him back. It is rare for a dog to bring back a lot of lambs when they have broken away; they may keep working as long as they like, but the lambs will only drift further away.

Burra, June 13.

Present—Messrs. F. A. S. Field (chair), F. G. Dawson, E. Goodridge, J. Duldig, A. McDonald, W. G. Hawkes, and R. M. Harvey (hon. sec.).

Breeding Draught Horses.—Mr. Field read a paper on breeding draught horses on the farm. He considered farmers did not pay sufficient attention to this matter. To get good draught stock they must first secure good mares. These were scarce in the district, being mostly too small. A weedy mare will not produce good draughts. A pedigreed stallion should be patronised even if the fee for service is double that of the ordinary mongrel. He preferred heavy draught horses, not too low set, for work on the farm. The horse with plenty of leg will walk faster when at work than will a short-legged animal. Breeding mares if carefuly treated can be worked to within a month of foaling, and be put into work again two months after foaling. It was better to work the mare right up to foaling than to work her too soon afterwards. Some members had worked their mare right up to foaling time and considered that if given only light work and carefully handled there would be less danger of a mishap than if turned out in the paddock with the young horses. Mares should be given at least a month's spell after foaling. It was agreed that generally the stallions travelling this district were a poor lot. The Chairman suggested that much good would result if a member of each branch could purchase a good stallion, and the other members combine to guarantee a certain number of mares each season at a remunerative price.

Worms in Pigs.—Mr. Dawson recommended charcoal as a remedy for worms in pigs. He had given ashes with good effect for the same complaint.

Dead Calf.—Mr. Field reported that about two months ago he noticed one of his cows was looking very miserable, and appeared to have hurt herself internally. She seemed to get better, but recently gave birth to a dead calf, the bones of which were separated from the flesh. The cow apparently went her full time, and had a good flow of milk.

Murray Bridge, June 20.

Present—Messrs. R. Edwards (chair), J. Stacker, J. G. Jaensch, J. Cowan, Heinrich Schubert, A. G. Kutzer, W. G. Hannaford, J. G. Neumann, W. Schubert, W. Lehmann (hon. sec.), and one visitor.

Swede Turnips.—Mr. W. Schubert tabled sample of swede turnip sown at end of March after rain. They were well grown, mild, and sweet, and a good table variety, being sweeter and more solid than the usual white varieties. He received seed from Central Bureau years ago, but had forgotten the name. [This is, I think, the usual result with seeds sent out by the Bureau; owing to the names being lost the value of the experiments is practically nil.—Ed.]

Reclaiming Swamp Land.—The hon. secretary initiated discussion on reclaiming and irrigating the River Murray swamps. Discussion was adjourned, and it was decided to visit the land reclaimed by Mr. Morphett with a view to obtaining more information as to cost and results.

Narridy, July 5.

Present—Messrs. J. Darley (chair), T. H. Smallacombe, A. Hiskey, E. Smart, James Nicholson, R. Satchell, B. Flavel, J. C. Myatt, J. Liddle, H. B. Turner, and Thomas Dunsford (hon. sec.).

Standard Weight of Wheat.—The question of having a fixed standard for the bushel of wheat was suggested for discussion at annual congress.

Incubators.—Mr. Turner read a paper on artificial incubation and rearing of chicks to the following effect:—

Great care is necessary in selecting an incubator, as unless the machine is ventilated correctly the evaporation of moisture contained in the egg is irregular, and consequently the result is the chicks die in the shell. Some machines provide a tray to hold water In my idea, this is an admission on the part of the maker that the machine is incorrectly designed; some, in fact, all the machines I know of made in South Australia provide for the water tray, and further advise damping or even spraying the eggs. In my opinion, the shell should never be dampened, as it has the same effect on the chick in the shell as wetting a cloth tied round a bottle to cool its contents, and I believe this cause alone is responsible for the loss of thousands of chicks every season. A machine to do its work effectively must be so designed that the ventilation is thorough and under control of the operator, so that the evaporation of the moisture proceeds regularly, and I strongly advise any one buying a machine to see that it is one which will require no added moisture. Then, again, many machines admit the air in such a manner that only a few eggs receive any ventilation whatever; consequently, the chick dies in the shell through suffocation

Having obtained the correct machine, it is equally necessary to provide suitable eggs, which must be fresh—not more than three or four days old. It is simply courting disaster to fill up the machine with stale eggs, although these same eggs would hatch fairly well under a hen. It is not my intention to minutely describe the working of an incubator, because every maker issues working instructions with each machine; but the following will apply to all:—The eggs should be gradually brought up to the correct temperature. I like to start my hatching at 102F., and end at 104F. By hatching at these temperatures I find the chicks arrive to time, and turn out strong, hardy chicks. If the heat is greater the chicks come too soon, and if lower, too late, and in each case prove inferior specimens. The machine should be run at as steady a heat as possible, but no harm will follow if it should drop to 90F., or rise to 120F., providing it is corrected in an hour or two. Of course care must be taken not to let this occur too often. I find it best not to interfere with the egg drawer after the 20th day till the hatch is all over. In my early attempts the drawer was occasionally opened to attend the pipped eggs, placing the fracture uppermost, with the result that a fair number died in the shells after chipping. Now I leave the drawer severely alone, with the result of better hatches. It is quite unnecessary to interfere with the egg, for the chick will come through safely, no matter where the fracture is.

As to brooders for chicks, I found the hot water brooder an utter failure, as the chicks become too hot at first, and too cold in the early morning. It was my lot usually to start the day by burying a few chicks. I soon tired of that expensive way of rearing chicks, and after experimenting made a brooder to hold 24 chicks. It is unwise to put more than that in a brooder, as they crush each other. The box is 6 in. deep at the back, and 4 in. at front, with holes near the top for ventilation. It is snugly lined with some old garments, thickly tacked to roof and sides. The floor is covered with a piece of sacking, which is easily and quickly cleaned. In this brooder I feel quite safe in leaving the chicks during the coldest nights. I put a board up in front to keep them in till they can be attended to, otherwise they would get out early in the morning, take cold, and die.

For the first 36 hours after hatching no food is provided, and I have experimented up to two days without injurious results. After trying a number of different plans for feeding chicks, I have found the following the best:—Lids of tins filled with clean small grit and charcoal are placed in the run—a large wire cage. It is surprising the quantity they will dispose of. Feed for the first two days solely on rolled oats, then gradually introduce wheat and canary seeds, giving them a sod to pick at and scramble over. If grass is not available, then lettuce or cabbage leaves finely chopped up will do. A little raw meat or cooked, cut up very fine, is necessary daily It is most amusing to watch the scrimmages over a piece too large to be swallowed readily. No drink is allowed for the first five to seven days, as my experience is that it causes bowel complaints. Care must be taken to prevent the chicks from standing in the water, as they soon become chilled. The plan I adopt with perfect success is to supply the drink—milk or water—in a large tin lid, partly pushed under the edge of the run. In this way only sufficient space is allowed to put in their little beaks, and it is quite impossible for them to stand in it No stale or sour food or drink should be available, as they soon cause bowel troubles. The chicks require very little at a time, but often. In my opinion, hard boiled egg should never be offered chicks, as it causes bowel complaints. If the chick is started right by the incubator, and attended to properly, in a fortnight it will have grown into a strong, hardy, independent little fellow.

[Mr. D. F. Laurie, our poultry writer, offers the following comments on this paper:—"I have seen hundreds of incubators at work, and have had many years' experience in practical working of the machines, but I never saw one that worked satisfactorily without some provision for keeping the air in the machine moist. Fully 10 years ago I warned poultry raisers against damping eggs. To allow the temperature of the machine to reach 120 deg. F. is, in my opinion, fatal to the embryo. To leave the chicks 36 hours without food is too long. Eggs up to 14 days' old can be placed in the incubator with reasonable hope of satisfactory results if the machine is suitable and properly managed."—Ed.]

Dawson, June 21.

Present—Messrs. R. Renton (chair), A. J. Hooper, D. Giddings, W. Kelly, J. H. L. Severin, J. Collins, C. Meyers, J. Nottle (hon. sec.), and one visitor.

Jersey Bull.—It was decided that as the Jersey bull purchased from the department has been stationed in the district for over two years, that it was desirable to secure another bull of the same breed, and the branch will be glad to exchange with another branch having a Jersey bull. [This bull is a well bred animal, and was selected for the department by Mr. Alick Murray, of Mount Crawford.—Ed.]

Meadows, June 25.

Present—Messrs. W. Pearson (chair), G. Ellis, T. B. Brooks, J. Catt, A. Stevens, T. A. Buttery, and D. D. Murphy (hon. sec.).

Annual Report.—During the year the average attendance has been satisfactory—viz., eleven members at each meeting. A number of useful and interesting papers had been prepared by members, and the meetings, on the whole, had been instructive. The retiring officers were re-elected. It was decided to have a question box in connection with the branch.

Arsenical Sprays.—The question was raised — "Would spraying with arsenic injure green crops growing round trees, &c.?" [Some very tender plants might suffer, but these are out of place in a commercial orchard.—Ed.]

Crystal Brook, July 19.

Present—Messrs. J. C. Symons (chair), W. Morrish, W. Hutchison, R. Pavy, P. Pavy, G. Davidson, A. Hamlyn, W. J. Venning, and F. S. Keen (hon. secretary).

Annual Report.—Twelve meetings held, with an average attendance of eight. Members were urged to attend more regularly, and to endeavour to make the meetings more attractive. A programme of subjects for discussion for next few meetings was drawn up.

Mundoora, July 18.

Present—Messrs. R. Harris (chair), W. D. Tonkin, J. Blake, W. J. Shearer, F. X. Beck, D. Owens, J. Angley, W. Aitchison, H. Haines, A. E. Gardiner (hon. secretary), and three visitors.

Harrowing Growing Crops.—Mr. Angley asked if any members had experience of harrowing growing crops or harrowing after the drill. The Chairman stated that on strong clay land, when the seed is sown about 1½ in. deep, he found it very beneficial to harrow the surface after drilling in the seed. Mr. Aitchison's experience was similar; if cross harrowed the weeds would be pulled up. Mr. Haines harrowed some of his crop last year after it was up, and found the wheat grew better, but the rust attacked it worse than where it had not been harrowed. Mr. Blake harrowed some of his crop, but found the wheat was pulled up too much. Mr. Angley promised to report later on on results from experiment in harrowing portion of his crop.

Quorn, July 24.

Present—Messrs. R. Thompson (chair), C. Patten, J. W. Smith, J. Cook, H. Altmann, W. Toll, J. Brewster, and A. F. Noll (hon. secretary).

Sampling Wheat.—Mr. Patten read a short paper on this subject. As one who had worked in three different flour mills, and had the looking after the cleaning of the wheat he felt bound to admit that the present system of sampling was not fair to the farmers. The buyers use only a small pair of scales, and exercise every care that the weight should be under rather than over estimated. The sample taken is very small, and any small deficiency in the sample tells up on the weight of the bushel. Then the small shaking sieve they use is of larger mesh than any drake sieve in the mills, and will let grains through that would be ground in the mill. Here again the farmer suffers. The Farmers' Union buyers are as bad as private dealers in these respects. Both these points should be rectified. Let the buyers test the weight on a bushel measure, and use screens that will let only drake and very small grains through.

Strathalbyn, July 31.

Present—Messrs. M. Rankine (chair), D. Gooch, W. J. Tucker, G. Sissons, R. Watt, W. M. Rankine, H. H. Butler, J. H. W. Mules, and J. Cheriton (hon secretary).

Death of Member.—Feeling reference was made to loss sustained by the death of Mr. Berry Smith, who for many years has been an active member of the branch.

Cattle Raising.—Mr. Mules read a paper on this subject to the following effect:—

The first object of the dairyman was to secure a herd of cattle suitable for the locality; a breed that will prove good foragers, of even disposition, healthy and capable of producing a large quantity of milk of good quality, and also a large carcase. He considered that the shorthorn cow of a good milking strain that had not been spoiled when young by feeding on forcing stuff the best. In her they had an animal with more desirable points than any other breed. The quantity and quality of the milk was good; she was hardy and strong; her calves were of better value; and when done milking she would put fat on a large frame. Where they looked for the fullest profits they must save the calves, no matter what the breed, and if the cow fails to give as much milk at her second calving as the dairyman considers necessary, she should be sold for beef. Many make the mistake of introducing to their herds a pedigree shorthorn bull of the beef strains. They should confine themselves to the shorthorn milking strains. Keep to one breed only. Study that one, and introduce any blood likely to prove beneficial in moderation, and eject all animals which do not show the characteristics wished for as soon as possible, and thus make room for those which do. Start with the best cows procurable at a price which suits your pocketbook, but expend liberally on a good bull. To get good results, it has been proved by men who have gone deeply into the matter that as good, if not better, results can be obtained by using a bull which suits for, say, six years, than by frequently changing the bull and trusting to the blood blending for a beneficial result every change. But by following the former style it necessitates more culling, as you must be more severe than in the case of frequent changes in the bull. The moment a bull throws weedy stock or deficient in any characteristic to a serious degree, get rid of him and all stock by him that you might use for breeding purposes, and consider the time involved a dead loss, but do not try to remedy the faults by using the faulty stock to a bull that is likely to prove better than his predecessor. He should have every opportunity to prove himself good, but not be put to faulty cows, thus introducing faults in the new strain which may last for many generations. The old saying that "the bull is half the herd" must not be allowed to obscure the fact that the cows are the other half, but this saying has been derived from the fact that with a good bull and inferior cows your herd will improve, while vice versa it will not, try as you may. The cattle in the surrounding districts, with very few exceptions, are a disgrace to those who own them, and judging by the specimens of "pedigreed" bulls occasionally sold in Strathalbyn they are not likely to improve. He had seen one lot only of well-grown cattle in the district.

Mr. Mules's paper was well discussed, and his contentions generally agreed with. Some members held that first cross with the Jersey on the milking strain of Shorthorn was an improvement.

Gumeracha, July 21.

Present—Messrs. J. R. Stephens (chair), W. Cornish, W. Jamieson, W. J. Hannaford, W. V. Bond, J. Monfries, W. A. Lee, H. W. Nosworthy, D. Hanna, and T. W. Martin (hon. secretary).

The Farm and Its Management.—Mr. Hanna read a paper on this subject as follows:—

The first thing to be considered in the management of a farm is the amount of capital which the occupier or tenant is possessed of, or of which he can procure at a reasonable rate. In the present state of agriculture, a man who has a farm of 200 acres of arable land, or land partly arable and part good pasture, will require from £150 to £200, and it is not in the interest of either landlord or tenant that he should occupy the farm unless he can command that sum. The amount of capital also depends upon the quality of the land. Very rich land requires less capital in proportion to the rent than poor land. The next important point is the condition and fertility of the soil, and the state it is left in by the preceding system of cultivation. Next to the nature of the soil is the situation of the farm, the position of the paddocks, and the adaptation of the farm buildings to the most profitable occupation of the farm. Good roads, leading to towns or railways, are an important object; also those leading to the different paddocks, the distance from these to the farm yards, and the convenience of good pasture, or land easily laid down with lucern or grasses near the homestead. The position of the farm buildings with respect to the land and an abundance of good water — all these circumstances greatly influence the probable profits and the value or rent which may be offered. Large straggling buildings are inconvenient, and cost much in repairs. The house should be neat and comfortable, and in accordance with the means of the occupier. The farm yards should, if possible, be situated north of the house, and sheltered on the north and west side by all necessary farm buildings. On the north side adjoining this should be the stackyard, where proper raised stands for stacks and the erection of hay shed or other buildings that may be required. Too rarely do the situation of the farm homestead and convenience of buildings receive the attention they deserve.

The improved methods of farming at the present time demand that the farmer should receive a more scientific education and better knowledge of the principles of his profession. The cultivation and preparation of the land for grain is most important. Ploughs and various other implements for breaking up and pulverizing the soil can be counted by the hundred, and it should be an easy matter to get the land in perfect order for the drill. Select for rotation the best and cleanest variety of wheat, oats, and peas you can get. Use plenty of manure, if you can afford to do so, experiment with the different kinds as much as possible, taking notice of the preceding crop and the manure applied to it. At the end of seeding grease bright parts of implements, oil harness, put everything under cover, and take a note of repairs or fittings required. Harvest your crop as soon as it is fit. I prefer cutting for hay as soon as the bloom has fallen. This hay is sweeter and more nutritious, and horses prefer it to over-ripe hay, and I think it would be preferred for export purposes. You need not be afraid to hold it if prices are very low, there being practically no grain in it. Mice or rats will do very little damage to it in the stack. Keep your binder in good order. It will pay to sharpen the knives at least once a day. This should ensure clean cutting, good tying, less waste in carting and stacking, and will save wear and tear and labour. Many farmers in this district excel in stack building and thatching, and if any one desires to learn the art, they cannot do better than get on the stack with a good builder, and note the correct method of doing the work. The oat crop would be most profitable if allowed to get fairly ripe; then cut with the binder, thrash with header, crush the oats for cows or horses, and chaff the headed hay, mix with crushed oats, and feed to the cows. Peas should be pulled as soon as they begin to turn yellow, and thrashed, cleaned, bagged, and put under cover as soon as possible; in fact, every crop should be secured against rain without delay, and all harvesting machinery cleaned and put under cover, and a note taken of all necessary repairs and parts required, and duplicates of principal wearing parts kept on hand.

If every farmer would observe the motto, "a place for everything, and everything in its place," and impress it upon the memories of their sons or employes their farms and homesteads would soon improve in appearance, and better order prevail. Horses, cattle, pigs, and fowls would be kept in their proper place, instead of having the liberty of helping themselves at the haystack, and vegetable and flower garden, destroying more than they eat, and frequently annoying the neighbours alongside. Root and fodder crops might also be grown with profit and grazed during the summer months. This would help to clean the land, increase its carrying capacity, and add to the income, either in the sale of fat stock or an increased return from the dairy herd. Keep enough low nuggety farm horses to do the farm work. Feed and groom them well after their day's work. I don't think it pays to keep working horses idle. Improve the dairy herd by purchasing a pure bred bull, of a good milking strain. Select the best heifers of his progeny, weigh and test the milk of each cow frequently. Keep all cows in good condition. Feed well those giving a fair supply of milk, especially when the food is cheap and the product dear. From January to May is usually the most profitable time to feed. All young stock should be kept in good condition. Merino sheep grow the best wool. For fattening purposes, buy or breed the Merino-Shropshire cross. They are good doers, and will clean and enrich the stubble or other land, and eat any fodder crop you like to grow. Pigs are profitable animals to dairymen, and the best fed and bred pig brings the highest price.

Farmers generally do not take sufficient care of their implements, machinery, and vehicles, and leave them exposed to all sorts and conditions of weather. Either laziness or want of money is the cause. Haystacks are left unthatched until considerable damage has been done to the hay, and numerous other losses occur through utter carelessness and neglect. Farm implements; in fact, few things on some farms are where they ought to be, and such farmers are not capable of training their sons or any one else to become farmers, and are unworthy of such a high calling. There can be no excuse for reckless farming, and little sympathy need be shown for the farmer who has ruined himself through wilfully disregarding the simplest principles of economy and sound practice.

[It would have been of interest had Mr. Hanna indicated how he thought the £150 to £200 capital should be laid out. Perhaps he will see his way to doing so at a future meeting. Our impression is that the sum is perhaps below actual requirements. Ed.]

Amyton, July 17.

Present—Messrs. J. Gunn (chair), J. Gray, W. Mills, James Gray, J. Kelly, T. Gunn, G. Wheaton, A. Gray, R. Brown, S. Thomas, W. Gum, F. Mullet (hon. secretary), and one visitor.

General Secretary.—Members expressed regret that circumstances should have necessitated the resignation of Mr. A. Molineux, who has done so much to advance the interests of the producers.

Fruitgrowing.—Mr. W. Gum read a paper on growing fruit in this district to the following effect:—

As far as his observations go, fruit cannot be grown here with only the rain to depend on. He believed, however, that on many of their farms there were places where conditions favourable to the growth of some of our hardiest fruits can be secured. This can, however, only be by aid of irrigation. First select soil that is suitable for irrigation, either a deep sandy loam or a fine limestone rubble. He preferred the latter, as the application of water did not cause it to set hard. There should be a catchment area of at least 10 acres in the vicinity. The land selected for irrigation should be as level as possible, or the water will flow across too quickly. After being fenced and prepared for planting, make a bank with close earth around it on three sides and about 2 ft. high to retain the water from the catchment area above. His experience was that if the garden is limestone rubble the trees will require all the water they can get, and usually more than you can give them. Sink holes for the trees as long before planting as possible, so as to let the bottom get thoroughly soaked before the trees are set out. Take care not to plant too deep, as irrigating in this way causes a considerable amount of silting up. In the event of rain not falling, keep the newly set out trees moist at the roots throughout the summer. After each flooding in spring and summer work the ground well in order to retain the moisture. About 10 years ago he planted 40 trees, consisting of peach, apricot, nectarine, plum, quince, and mulberry, and under the treatment suggested they have produced some excellent crops of fruit. Some have not done as well as others, but those doing best are situated where the water retained by the bank after rain is deepest— up to 1 ft. at times. The peach appears to be best and the plum least suited to these conditions. Apricots and mulberries do well also. Of late years the worst difficulty to contend with has been the locusts, which have stormed the garden time after time in the fruit season. Two years ago the trees were nearly destroyed by them, and he not only lost that season's crop, but also the next, as what should have developed into fruit spurs were destroyed. He found the trees were slowly recovering, and that the best way to bring them back to a vigorous condition was to cut them hard back, and let them make a new top altogether. A few treated in this way now have a good growth, but those not cut hard back are very straggly in appearance.

To make the best use of the garden they should preserve as much of the fruit a possible, and so have it available all the year round. After making all the jam required, put the rest up in bottles, tins, or jars. He tabled samples of peaches put down in 1892 in glass jars, which were still fresh in appearance, and of good flavour He found the freestone peaches best for this purpose. In preserving fruit halve and stone peaches and apricots, pack in the jars flat side down, then fill up with syrup made by dissolving 1 lb. of sugar to the gallon of water; screw on tops tight, place bottles in boiler in cold water, and bring up to the boil. If the air is escaping from any of the bottles take them out and screw the tops tighter. Glass jars with enamelled screw-top lids were best, but tins or bottles that will keep the air out will do.

A lengthy discussion ensued on the various points of the paper, which was in the main endorsed by the members. Mr. A. Gray favoured trenching the ground for planting instead of ploughing and digging holes. Fruitgrowing in this district on clay land was admitted to be a mistake, as it set too hard after irrigation.

Balaklava, July 12.

Present—Messrs. A. Manley (chair), P. Anderson, G. Reid, W. Smith, A. W. Robinson, W. Tiller, G. C. Neville, T. A. Thomas, and E. M. Sage (hon. secretary).

Steinwedel Testimonial.—Members desire to notify to subscribers to this fund the fact that the balance left over after payment for the illuminated address has been devoted to the purchase of an easy chair, which was presented to Mr. Steinwedel on behalf of the subscribers.

Annual Report.—Ten meetings have been held with an average attendance of ten members. Only two papers were read during the year, but a number of practical subjects had been discussed, and the interest in the work of the branch well maintained.

Peachgrowing on a 15-in. Rainfall.—The hon. secretary points out that his paper, as published in the July Journal would infer that the rainfall is never less than 15 in., an interpretation that he never intended should be placed on it. He thought he could claim to have grown good peaches consistently over a period of eight or ten years when the rainfall has averaged considerably under 15 in. In 1895 the fall at Balaklava was 20 in., and the following years only 13.76, 14.84, 10.69, 15.33, 12.7, and 13.78 respectively.

Horsebreeding.—Mr. Manley read a paper on this to the following effect:—

There was no question that our draught stock has deteriorated. In the fifties we had a far better class of horses than now, and we had men of means and spirit to import new blood every few years. Of late years, however, there has been very little new blood imported. When in Victoria five or six years ago he saw some horses imported from New Zealand; they were something like the Lancashire horse, very big and long in the barrel, and splendid for dray work. They had not so much hair as the Clydesdale, but were big upstanding horses, and of the class which in his opinion they needed here to cross with their small, low-set mares. While they did not want leggy horses, those too low set got slow, and required a lot of driving to get them along at any pace. The question of the improvement in their horsestock came, in his opinion, next in importance to the improvement of their crops and in the price of produce They should take up this question vigorously; there was no doubt as to the necessity for it, as the teams seen in the district afforded ample proof. In his opinion they wanted fresh blood, and pure draught strains at that. It seemed to him that surely it was possible for the branches to work out some scheme, with or without Government assistance, by which it would be possible to secure the services of suitable stallions at a reasonable cost. Probably some help, such as was given by the department to the dairying industry by loaning pure-bred bulls to the branches, might be extended to farmers with lasting benefit to the State.

This paper was well discussed, there being considerable difference of opinion as to the class of horse most suitable for farm work. Some favoured a heavy pure draught, the stronger the better, but not clumsy. Others, however, advocated half-bred, or at any rate light, active, quick-moving horses. It was admitted that the question to a large extent depended upon the class of land to be worked, those having heavy soils leaning to the heaviest stock, whereas members working the scrublands preferred the more active horse. Mr. Anderson advocated co-operative effort to improve their horse stock rather than asking the Government to help. Mr. Smith contended that the owners of good stallions were largely responsible for the deterioration of stock. No matter what the fee for service they will accept as many mares as offered, with the result that the stallion was uncertain and his stock inferior. Breeders naturally fell back on the inferior horses, which were not so much patronised. If the number of mares was limited there would be a surer return to both parties, and the standard of horses would improve. For active farm horses half-breeds were preferred by several members, a good heavy draught as one parent being essential.

Rhine Villa, July 19.

Present—Messrs. G. A. Payne (chair), H. Mickan, W. Farey, A. Lewis, J Vigar (Hon. Secretary), and two visitors.

Ploughs.—Mr. Mickan initiated a discussion on this subject. Most of the old stumpjump ploughs did not turn the furrows properly, but left a ridge undisturbed between the furrows. They wanted a light strong plough that turned the furrow completely over, the up-to-date skim plough being most suitable. He thought that in the near future most large farms would go in for five or six-furrow ploughs in order to get over the land in as little time as possible. Messrs. Farey and Vigar preferred set ploughs where it was possible to use them, as they made a better seed bed.

Naracoorte, July 12.

Present—Messrs. S. Schinkel (chair), J. Wynes, F. Welcome, P. Anderson, J. B. Bennett G. Wardle, J. G. Forster, H. Buck, A. Caldwell, and W. A. Terry (hon. secretary).

Horse Complaint.—Mr. Buck called attention to complaint prevalent among horses around Sale, Victoria. The hindquarters became paralysed, and the animals are unable to get about. On post-mortem examination being made the intestines were found to be swarming with worms.

Ploughs and Ploughing.—Mr. Buck read a paper on this subject to the following effect:—

In the south-east there are a variety of soils that require different ploughs and different settings. A soil in which the plough cleans itself requires a share with a high wing and a gradual rise towards the mouldboards. The mouldboard should be 3 ft. 6 in. long, and full in the centre to set the furrow well up and make a good seed bed. The beam must not be too low, or it will gather stubble and thistles. For sticky soil a different plough altogether is required, and he could recommend the YFL brand. The share picks the furrow up well; the mouldboard is short, turning the furrow over quickly, but the work is rather flat, and there is no seed bed. This makes no difference if the soil is worked down well with the harrows before drilling. The low price of wheat necessitates the use of the double-furrow ploughs for economy sake. Many of these are not suitable for sticky land. The ploughman should note any defects, and point out to the smith where alterations are needed. In many the draught is not right; it should always be regulated by shifting notches, and not by a pin which gets tight. The distance from the front of the plough to the wing of the share is too short. It would be 18 in. long, as the large wheel, if too close to the wing, comes in contact with the furrow, and also stops the furrow from passing along. The distance from the point of the share to the bottom of the beam should be about 18 in., to allow a free passage for rubbish. The stays between the two beams should be an inch thick and fastened with two removing bolts. The old hollow-tube stays with ⅝-in. bolt were not strong enough, often allowing the plough to expand on entering stiff soil. The steel share is best, as it can be drawn out and worked to a finish. In sticky soils the coulter should be sharpened on both sides, and the thinner the better.

Season.—Members reported the grass to be very backward, and stock, particularly cattle, poor. Lambing was bad, and many sheep were dying. In some parts blowflies had been troublesome, the wool rotting and coming away in consequence.

Foxes.—Mr. Buck reported having poisoned the pluck of a sheep and distributed it about in small pieces. Next morning he found two dead foxes, and later on five more. He believed some of the damage among lambs attributed to foxes was really done by eaglehawks.

Mount Pleasant, July 11.

Present—Messrs. G. Phillis (chair), P. Miller, J. F. Miller, E. Miller, J. Maxwell, G. A. Vigar, V. Tapscott, R. Godfree, and H. A. Giles (hon. secretary).

Hills Conference.—It was decided to send delegates to conference of Hills branches, to be held at Forest Range on October 16.

Season.—Stock are looking well for this season of the year. The dry weather and frosts have affected the feed. Some of the cereal crops are coming through badly. Land sown since last rain has set down and caked, and the wheat plant cannot break through.

Baroota Whim, July 12.

Present—Messrs. F. H. Flugge (chair), W. Brideson, C. F. Bessen, A. Raneburg, and C. W. Hoskin (hon. secretary).

Season.—Discussion on the season's prospects took place. The rainfall recorded since beginning of April is:—April, 0.30; May, 0.98; June, 1.15; July (to 21), 0.21. Crops on clay land are dying off for want of rain. On sandy soil the crops are doing better. Feed is very backward owing to heavy frosts. Stock appear healthy, but are low in condition.

Tanunda, July 17.

Present—Messrs. J. H. Walden (chair), P. Trimmer, F. W. Graetz, C. Heineman (hon. secretary), and one visitor.

Bird Pests.—At previous meeting Mr. T. Brock read the following paper on the "Sparrow and Starling Nuisance":—

That these pests have become a serious question and a curse to the State is now an established fact, but how to deal with them and check their advance still remains a problem. In fact, in spite of every endeavour to destroy them, their increase is alarmingly rapid and the havoc done is great, both in the cornfields and fruit gardens. A tax to growers they are and will remain, besides which they pollute tank water which, I consider, is partly responsible for so much sickness. Now, what I suggest and what I am anxious to see, is a sparrow and starling tax; a tax where heads should be accepted as cash, and persons not in a position to destroy the birds could hand their tax in cash to those who could. There would be plenty of competition among the boys to earn the tax money. To protect the State from sparrow farming, under no condition should eggs be accepted, as otherwise no small return could be gained by a well worked sparrow farm; in fact, I am inclined to think that they would pay as well as the fowls. It would also be wise to leave the male birds alone, if it were possible, as an excess of males disturbs the breeding. As the pests become scarce the tax could be reduced. Say an increase of 2/ in the pound on the present rates, payable to the District Council; there will be plenty of heads to dispose of the debt the first year.

Cultivation of Vineyards.—It was decided to carry out proposal to offer prizes for best cultivated vineyards in conjunction with the Angaston branch, a committee being appointed to act with Angaston committee in arranging details.

Tatiara, July 19.

Present—Messrs. W. E. Fisher (chair), C. H. Wiese, J. Rankin, R. Penny, P. Low, D. Makin, F. Smith, E. Prescott, T. Hall, and T. Stanton (hon. secretary).

General Secretary.—A resolution expressing regret at the resignation of Mr. A. Molineux, and appreciation of his services, was carried unanimously.

Horse-breeding.—A long discussion took place on how to breed good roadster horses. It was decided to ask that the question—"What is a roadster horse, and how to breed it?" be forwarded for discussion at Free Parliament in connection with the annual congress. [This is too big a subject. Discussions at Free Parliament are limited to 15 minutes.—Ed.]

Swan Reach, July 19.

Present—Messrs. J. L. Baker (chair), P. A. Haase, E. Micke, W. Hecker, B Schwatz, F. Fisher, R. J. Harris (hon. secretary), J. Retallack, of Forster branch, and one other visitor.

Farmyard Manure.—Mr. Baker read a paper on this subject. He recommended carting the manure and stacking it for two or three years to let it rot thoroughly. Mr. Hecker considered it better to spread the manure on the land and plough it in at once. It would do more good, though it would make the land weedy. Mr. Arnold (visitor) thought much of the ammonia would be lost if left in the heap for two years. He always kept a large cask by the house into which the ashes, bones, &c., were put, and when it was full a gallon of sulphuric acid diluted with an equal amount of water was poured in. He found this made a splendid manure. Mr. Retallack considered new manure made the land too hot in this district, and would cause the crops to blight. It would be better to put the manure in a pit to rot.

Wandearah, July 21.

Present—Messrs. G. Robertson (chair), W. Roberts, G. Collins, J. Kurl, J. Wall, L. Stanley, and C. E. Birks (hon. secretary).

Fertilizers. Discussion took place on the results of application of fertilizers The Chairman thought that instruction by officers with a good knowledge of manures and their uses would be of great benefit to farmers.

Rolling. Discussion on rolling crops took place. There was wide difference of opinion on the subject. Some favoured rolling before the crop is up, others objected that it would form a crust on the surface in the event of heavy rain.

Improving Usefulness of Branch. The Chairman suggested that each member should take it in turn to initiate a discussion, and the subject should be announced at the previous meeting to allow members to come fully prepared to discuss it. He undertook to be responsible for a discussion at next meeting on "Co-operation to improve our draught stock."

Annual Report.—The hon. secretary reported that the attendance during the past year averaged 9.4 members, with 7 meetings held. Officers were thanked, and re-elected.

Season.—Rainfall recorded for month to 21st only 0.30, and for year to date a little over 3 in., but it has been very patchy throughout the district.

Kingston, July 5.

Present—Messrs. W. W. Pinches (chair), T. A. McCulloch, F. W. Barnett, E. J. Flint, G. B. McBain, T. Pinkerton, T. Redman, E. Goode, D. S. Cooper, E. M. Flint, and F. S. Wight (hon. secretary).

Wool Samples.—Mr. McBain tabled two samples of Bradford tops, Nos. 40 and 70, which were inspected with interest.

Merino and Crossbred Sheep.—At previous meeting Messrs. E. Goode and R. J. Flint read papers dealing with the most suitable sheep for this district. The following is the substance of Mr. Flint's paper:–

> My opinion is that the strong woolled merino is most suitable, because it has a better constitution than the fine wooled merino, thrives on poorer pasture, and is not so liable to disease. I found that Nalpa rams and strong woolled ewes produce the right kind of sheep for this district, and to give the sheep size the ewe should not be turned into the flock before it is two years old. That increases the size and strength of the offspring. In no case should the sire and ewe be both aged, as there would generally be a number of small and weekly lambs; at least either the ram or the ewe should be young. When a fine woolled sheep is out of condition there is often a break in the wool, but it is not so with a strong woolled sheep, because it has not so many fibres to feed. The fine wool will, perhaps, bring more per pound in the London market than the strong wool, but their death rate is heavier. What the breeder loses by the wool he makes up when the sheep are put on the market, having larger frames and heavier weights. The ram should not be with the ewes more than six weeks. You would have a more even lot of lambs. Turn them out about November 1, and they will finish lambing by the middle of May, so that the lamb will be strong before the cold weather sets in in June. The advantage in having the early rains is that you can wean the lambs from the shears, and the ewes will be in good condition for next season, or fatten, whichever you wish to do. Another advantage of an early lamb is it will cut about 2 lb. of wool at shearing time, when a later one will only cut about 1 lb.

Mr. Goode contended that crossbreds were the best sheep to keep on country where fodder could be grown to fatten them. Land that was wet in winter was suitable for the growth of fodder crops. He advocated the Shropshire cross for fattening. Only pure-bred sires should be used when going beyond the first cross. Mr. Flint said crossbreds required the best country; generally for the south-east they could not beat the pure merino. Members were of opinion that much of the swampy country in this district would produce good crops of mangolds for stock feeding. Rape, sugar beet, and sunflowers were also mentioned as being suitable for cultivation for fodder. After discussion on the relative merits of merino and crossbreds, it was resolved that in the opinion of the members crossbred sheep were best suited for certain localities that had been improved, and were also best for fattening for market but for the country in its natural condition the merino was most profitable.

Wattles.–In reply to question Mr. Wight said that wattle seed that went soft when scalded was no good. He had grown wattles from seed put into water at boiling point. In May last he sowed some after dipping in boiling water, but they had not germinated. Members attributed this to the dry weather.

Field Trial.—It was decided to arrange for a field trial of implements capable of breaking up the soil on the hard flats in the district; trial to take place on August 2.

Richman's Creek, July 21.

Present–Messrs. W. Freebairn (chair), A. Knauerhase, J. M. Kelly, J. J. Gebert, J. J. Searle, W. J. Wright, A. Nicholson, E. Roberts, P. J. O'Donohue, and J. McColl (hon. secretary).

Annual Report.—Nine meetings held with an average attendance of over nine members. Four papers were read and discussed, the hon. secretary being responsible for three. [An unfair division of labour. Other members should take their fair share of the work.—Ed.] The attendance has only been fair, and shows a falling-off. Some members have been unavoidably absent, but others could have attended more regularly than they have done. Another matter required attention; every member should do something towards making the meetings profitable instead of leaving it to two or three. In view of the condition of affairs members did not think it wise to enforce the attendance rule strictly. Officers were thanked and re-elected.

Season.—Owing to absence of rain prospects are anything but cheering; feed is becoming very scarce, and farmers are put to considerable hardships. The rainfall for six months ending June 30 has totalled about 3 in., but some parts of the district have had considerably less.

Burra, July 11.

Present—Messrs. F. A. S. Field (chair), J. Duldig, J. Flower, J. Arnold, J. Scott, A. McDonald, W. Heinrich, and R. M. Harvey (hon. sec.).

Conservation of Fodder.—Mr. Scott read a paper.—"This is a very important matter, and, prompted by experience of the past, every wise farmer is careful to save enough hay for his own use, many also saving a good supply of wheaten chaff; but it would be advisable to add to the variety by filling a small pit with ensilage. Ensilage has been practised on a comparatively small scale in this state for many years, and for dairymen it is undoubtedly of great value. In 1892 we put in a small pit, filling it up with green fodder, principally barley and rye, as well as any rank barley grass, marshmallow, clover, &c. The pit was filled up, allowed to settle, and filled again, until it would hold no more, then weighted with posts and old iron. Three or four months later when opened it smelt very strong, and the cows would not touch it at first. They soon got over this, and became very fond of the ensilage. The following year we put up a stack of barley and rye, cut one day and carted the next. Owing to being insufficiently weighted it was somewhat spoilt, and stock did not care for it. There was no doubt that ensilage was a good thing for dairy farmers, sweet ensilage being best. Its use may help to keep down diseases of the digestive organs. What farmers must consider is whether they will get as good results from hay, chaff, crushed corn, &c., or whether the ensilage will more than compensate for the extra trouble." Members considered that a stack or pit of ensilage would prove very useful to farmers during the summer time, and probably its use would tend to prevent losses from impaction and similar troubles. The Chairman reported that further rains were needed, as the ground was drying very quickly, and some of the silver grass was already going to seed. The recent heavy frosts have prevented the feed from making any headway.

Carrieton, July 10.

Present—Messrs. W. J. Gleeson (chair), O. Hall, F. Kaerger, W. Steinke, A. Steinke, J. W. Cogan, F. Vater, J. Harrington, J. W. Bock (hon. sec.), and three visitors.

Land on Eyre's Peninsula.—Messrs. Hall and Kaerger reported at length on their inspection of land on Eyre's Peninsula open for selection. Members generally were of opinion that on account of the land being thickly covered with brush and infested with vermin, and, in addition, timber for fencing being scarce, the locality required men with some capital to work it with any reasonable prospect of success.

Yorketown, July 12.

Present—Messrs. J. Koth (chair), J. Jung, C. Domaschenz, C. Anderson, S. Vanstone, G. Bull, B. Lloyd, C. H. Davey, R. Newbold, and J. Davey (hon. sec.).

Annual Report.—The hon. secretary reported that during the past year eleven meetings had been held, with an average attendance of seven members. Several papers had been read, including some read at other branch meetings, and printed in The Journal of Agriculture. Messrs. B. Lloyd and R. Newbold were elected Chairman and hon. secretary for ensuing year.

Mount Gambier, July 12.

Present.—Messrs. W. Mitchell (chair), A. J. Wedd, J. Watson, J. C. Ruwoldt, W. Barrows, W. J. T. Clarke, T. H. Williams, T. Edwards, D. Norman, sen., M. C. Wilson, D. Norman, jun., and E. Lewis (hon. sec.).

General Secretary.—Members expressed their appreciation of the services rendered by the late General Secretary, and regretted that it had been necessary for him to sever his connection with the Bureau.

Utilization of Waste Lands.—Mr. Wedd read a paper on "How to Make Use of Our Waste Lands" to the following effect:—

I think any of our farmers, with poor sandy and ferny lands, that they count as useless, may, by planting timber on it, make it the most useful and profitable part of their farm. The necessity for planting timber is plain to any one who will just travel over the district, for our native forest has all disappeared, and the land has now become an open plain. No doubt this will materially affect our rainfall, and to a great extent alter our climate. I would strongly recommend planting wattle trees, for they are quick growing, and form a good shade and shelter for stock, besides becoming very profitable to the grower after a few years. As regards the sort of wattle to plant it will depend somewhat upon the soil and the part of the district needed to be planted. Mr. Pick, of Caroline, strongly recommends the broad leaf black or golden wattle. He planted 160 acres of them on very poor sandy soil not worth 1/ per acre rent, and in nine or ten years he has stripped two and a half tons of bark per acre, and sold the bark for £5 per ton. The cost of stripping depends upon the size of the trees. In small trees it costs 30/ per ton, and 25/ where the trees are larger, and thus proving that it will pay, for he has received a return of £1 per acre per year for the nine years after paying all expenses. Mr. Bucknell, of Dartmoor, does not like this wattle. In his district it does not do nearly so well as in the hills near Adelaide. The feather leaf or district wattle does much better with him. It grows so much faster and will give a better return in bark, for from ten-year-old trees in sandy land he gets about five tons of bark to the acre, and pays 25/ per ton for stripping and making into bundles. The trees of this wattle need not be planted nearly so closely together as the broad leaf. They should be planted about 20 ft. apart or 100 trees to the acre, but the difficulty is that they are subject to the blight, and the rabbits eat them off when they first come out of the ground. Some people run plough furrows about 10 ft. apart, and then drop the seed in the distance that it suits best, and others dib the seed in, whilst some sow broadcast. I think that the plough is best in clear land and dibbing in rough land. The seed must be boiled for about two minutes, then put in a flannel, and kept for a few days until it is about to burst. Sow in cool, damp weather, or else if the seed is left to dry it will be spoilt. It takes about 1½ lb. to the acre of the broad leaf and about half that amount of the feather leaf. A man with a pair of horses can plant several acres in a day with a lad to drop the seed in the furrow behind him, or a man can dib in about three acres per day. The cost of seed is about 6d. per lb. I feel sure that the stringybark, one of the most durable of our native timber, will also pay well if our farmers would only put in a few acres in some of their most sandy soil. In a few years it would grow into a forest of valuable timber, the demand for which cannot be supplied out of our natural forests. The seed is easily obtainable, or they could get thousands of young plants after a fire had passed over the forest where the stringybark once grew. There is also the redgum, which does well in almost any soil in this district, and is a most valuable timber for many purposes. There is a number of other sorts of trees that would do well, such as sheoak, blackwood, and Pinus insignis. I feel confident that the latter will become of value for timber in the future. The reason why the pine is not looked upon with favour is, I believe, that it has been planted in the wrong place. People have planted it around their gardens and houses, and it has robbed the garden of all nourishment and become a nuisance; but if it had been planted around the stockyard or in some corner it would have become a blessing and not a nuisance. All the above timbers will grow on our most sandy and poorest soils, and do away with the excuses that the farmers cannot spare the good land for tree planting.

A good discussion ensued. It was mentioned that although the silver wattle might not be as rich in tanin as the broadleaf, buyers made no difference in price, and consequently the yield was of most concern to the grower. The broadleaf wattle grew to 20 ft. or more in height in this locality, but the bark was not so thick as that grown round Adelaide. Mr. Edwards said as soon as the brown galls were noticed on the trees the bark should be stripped, as the trees make little growth when attacked by galls. Messrs. Williams and Norman referred to the beneficial effect of trees on the climate, and the necessity for tree planting by landowners.

Worms in Horses.—Mr. Williams tabled tumour from horse's stomach badly infested by worms. For worms in horses he advised turpentine or special worm powders given in milk.

Milk Fever.—Mr. Williams tabled remedy for milk fever in cows published recently in Western Australia. This was half a bottle of brandy or whisky and the same quantity of raw linseed oil, well mixed, and given in one dose. The writer mentioned several severe cases that he had successfully treated in this way. Mr. Edwards gave carbonate of soda as soon as any indications of fever were noticed. Mr. Ruwoldt gave strong coffee and carbonate of soda in similar cases.

Lyndoch, July 17.

Present—Messrs. H. Kennedy (chair), R. Ross, W. Rushall, jun., H. Springbett, W. J. Springbett, and J. Mitchell (hon. sec.).

Orchard Cultivation and Pruning.—The Chairman reported visit by Mr. G. Quinn on July 3, when he gave practical demonstrations in the pruning of fruit trees. At the same time the Australasian Implement Company sent several orchard cultivators, and gave working tests of same. A considerable number of visitors were present, and an instructive day was spent. In the evening Mr. Quinn gave an address on manures.

Boothby, July 24.

Present—Messrs. J. T. Whyte (chair), R. Carn, H. S. Robinson, W. Sims, T. Sims, W. B. McEwen, A. A. Turnbull (hon. sec.), and three visitors.

General Secretary.—Regret was expressed at the resignation of the late General Secretary, the members being of opinion that his resignation was a severe loss to the agricultural community.

Planting Vines.—Mr. Sims wished to know best time to plant vines and depth to plant. [Plant rooted vines as soon after fall of leaves as possible. June and July the best months in most districts.—Ed.]

Superphosphates for Vegetables.—Discussion took place on best way to apply super. to vegetable crops, some members having had poor results from it. It was thought that this was due to application of too heavy dressings. Mr. Sims preferred to apply it in water, dissolving a tablespoonful in a gallon of water and apply at time of sowing. [Super. can be used as a liquid manure at any time during the growth of the crops, and good results may be obtained by dusting it along the rows, hoeing it in, and then watering.—Ed.]

Stansbury, July 5.

Present—Messrs. A. Anderson (chair), P. Anderson, J. Antonio, A. Agnew, C. Faulkner, J. Henderson, J. Sherriff, and P. Cornish (hon. sec.).

Wool Class.—It was decided to endeavour to arrange for class on wool-classing, under the instruction of Mr. George Jeffrey, Wool Instructor to School of Mines.

Pruning Match.—A vine-pruning contest and exhibition of orchard cultivation was held in connection with the branch on July 9 in Mr. H. C. Pitt's vineyard. There were a fair number of competitors, and great interest was taken in the work done. Messrs. Clutterbuck Brothers and the Australasian Implement Company showed orchard ploughs and cultivators at work.

Forest Range, July 17.

Present—Messrs. G. Monks (chair), A. Green, J. Green, F. Mason, J. Vickers, H. Green, R. Green, R. E. Townsend, E. Rowley, W. McLaren, H. Waters, J. G. Rogers, and F. Green (hon. secretary).

Conference.—It was decided to ask Professor Towar to give a paper on "Cultivation of the Soil" on the basis of a 35-inch rainfall, and Mr. George Quinn one on "Arsenical Spraying," at the Conference of Hills Branches, to be held at Forest Range in October.

Worms in Pigs.—Mr. Walters asked for remedy for this complaint. [Give a dessertspoonful of turps in half a pint linseed oil, and a few hours later give half dram each of sulphur and sulphate of iron in a pint of linseed tea. For young pigs give a teaspoonful of sulphate of iron two or three times in the food.—Ed.]

Wounds on Fruit Trees.—Mr. H. Green wished to know best treatment of large wounds on apple trees to prevent decay. [Clean the wounds with a sharp knife and paint with ordinary lead paint. A piece of sacking round the wound to shade it helps the healing process.—Ed.]

Plums.—Mr. R. Green read a paper on "Growing Plums." He did not consider it paid to grow plums for 9d. or 1/ per case. Too many Black Diamond and Prince Englebert plums are grown; they are heavy bearers, and not appreciated by the jam manufacturers, as they require too much sugar.. They only fetch a low price—so low, in fact, that often it does not pay to pick and cart to the factories. Many gardeners say, however, they bear every year and heavily, but they lose sight of the fact that they cause a glut and reduce prices for the better sorts. If the gardeners were to cut these kinds down and work them to Golden Drop, Green Gage, Reine Victoria, and others they would get better prices, even with smaller crops, and less work in earning it.

Hartley, July 18.

Present—Messrs. J. Stanton (chair), W. Klenke, A. Thiele, H. Reimers, A. Jaensch, T. Jaensch, and B. Wundersitz (hon. secretary).

Dairying.—Mr. J. Jaensch forwarded a paper in which he advocated the purchase by the members of a pure bred bull of a good dairying strain. He did not consider the Holstein suited to this locality, while the progeny of the Jersey or Alderney were useless for beef. He thought the Shorthorn the best for their requirements. Members generally were of the same opinion, and it was decided to make enquiries concerning cost of good bull, and whether the department would assist the branch in the matter.

Mannum, July 22.

Present—Messrs. J. G. Preiss (chair), J. W. Walker, B. Baseby, F. E. Schuetze, J. W. Haby, E. A. Ramm, J. A. Schulze, and W. G. Wilson (hon. secretary).

Officers.—Mr. W. H. Quartly tendered his resignation as hon. secretary, as he had left the district. Mr. W. G. Wilson was appointed to the vacant position.

Manure Deposit.—Mr. Walker reported that a deposit on the banks of the river at Stone Wall was being worked by Mr. H. A. Giles, of Mount Pleasant, who had already removed a considerable quantity of material which he intended to use as manure.

Best Wheats.—Discussion took place on best wheats to grow for milling. Members were of opinion that the testing mill at Roseworthy should be erected and put in working order to enable farmers to have wheat tested. [The mill is to be erected at the School of Mines, Adelaide, at an early date.—Ed.]

Foxes.—It was reported that foxes had been noticed in the district.

Mallala, July 14.

Present—Messrs. F. M. Worden (chair), H. B. Moody, James Nairn, T. Nevin, J. Jenkins, M. H. East, A. Moody, W. R. Stephenson (hon. secretary), and three visitors.

Shelter for Cattle and Implements.—Mr. H. B. Moody read a paper on this subject to the following effect:—

Do farmers pay sufficient attention to the housing and sheltering of their live stock, or do they take enough care of their farm implements, are questions that might occur to a cursory visitor to this State, and it might be thought by such a person that in this salubrious climate there is little need for the former. Those who have had experience in the management of stock will readily admit that while it is possible for stock to exist in bleak open fields on a fair amount of food, no good results must be expected unless the animals can find protection from either heat or cold. How such shelter can be cheapest and best supplied is a subject of much importance, and one that cannot be neglected if we wish to make our farms comfortable and prosperous. With those who can afford to build barns and sheds of stone and iron the task is comparatively an easy one, but I would not again spend very much in making walls of stone or iron, as in the majority of instances the money so expended would be put to much greater advantage in roofing a larger area, making a shed adequate to the general requirements of this climate, and providing more catchment for water. Though far from picturesque, the straw shed has many good points to recommend it, and much that is too frequently unsightly about it could be improved, with a little care and judgment in its construction. Forks or props that are intended to carry the eaves instead of being under them, where they would receive protection themselves from the weather, are often found a foot or more beyond. Large quantities of wood are placed on top to keep the wind from blowing off the straw, adding much weight to the rafters, and causing them to sag, when at very little expense the whole roof could be covered with wire-netting, which would also prevent the poultry from disturbing the straw. Another common error is, the centre forks are too short, and in a vain effort to raise the roof in the middle too much straw is piled on, with the result that a heavy rain forces the forks further into the ground. Where forks cannot be got long enough for the middle rows, it is better to substitute a straight pole, making a cross head with a short piece half morticed and bolted to the pole. The ridge-poles can be fixed to this by placing one each side of the pole, and spiking them to the cross piece, or to the pole itself. Immediately over the forks, and extending from the ridge to the wall plate, good stout pieces should be laid, spiked top and bottom, and allowed to project at least two feet over the wall plates. The spaces between these can be filled up with light parallels, about 1½ in. in diameter, placed about one foot apart. A good plan is to put a good strong piece of timber over and across the parallels, about midway between the rows of forks, and resting on the stronger pieces that have been spiked to the ridge and wall plate. This will have the effect of concentrating the weight of the straw over the forks. Where a difficulty is found in getting sufficient small timber to form the parallels, larger pieces may be placed about two feet apart, and the whole framework covered with a small mesh wire-netting, which will take the place of the timber, and also exclude the sparrow from the straw in the roof. I consider it the better way to roof with loose straw, and, if possible, to put all that is required on at one time, as it then all settles down together.

Trees of almost any kind serve in the summer to cool the air, and give shade, but unfortunately, the sugar gum, which does so well on clay land, owing to the bareness of its trunk, does not afford much shelter for stock during winter. African box thorn does well in almost any soil, makes a splendid fence, an ideal shelter for lambs, might often serve to prevent a sand drift, and it is said that poultry thrive on its leaves and berries. [This is so.—Ed.] Natural scrub, where not thick enough to prevent the grass from growing, should be allowed to remain on a portion of the farm until better shelter has been provided to take its place. Tree lucern, if protected from the stock, will make a good breakwind, and in a time of drought might be the means of saving many animals from starvation. Burning the straw where the stripper has been used to harvest the crop has little to recommend it. In all paddocks that are bare of other shelter, a good big stack of straw should be got together and allowed to settle down tight before allowing the cattle to have access to it, when it will be found they derive much comfort as well as a part of their food, and will gradually convert it into a valuable quantity of manure. Cattle require to lay down at night, and during cold weather, and will generally look for a heap of straw or chaff, or some other decaying vegetation which creates warmth during decomposition, and unless these comforts receive the attention of their owners, many good results that might otherwise be attained will still be wanting.

Davenport, July 9.

Present—Messrs. W. J. Trembath (chair), F. Pybus, F. B. Rathbone, W. Hodshon, sen., D. J. Brown, A. McDonald, T. McDowell, T. Trottman, J. Roberts, J. Holdsworth, and J. E. Lecky (hon. sec.).

Minor Industries.—Mr. Rathbone read a paper on this subject to following effect:—

It has struck me in connection with this branch of the Bureau that of all our members only three are engaged in the pursuit to which the Bureau owes its origin. Why is this? Is it because those members who do not belong to the agricultural or pastoral profession have gained sufficient knowledge from their amateur attempts to convince them that it is more profitable to be a mechanic or a business man, than to endeavour to make a living from the soil? No doubt in theory the life on the land is the ideal one, but in practice, I am afraid, it is not such a rosy one as many of us could desire. Certain it is that of all the members we have had and now have in this branch I do not think there is one who has, or who is likely to throw up, his present means of livelihood and devote himself to the soil. It is, therefore, I think, with great diffidence we should seek to dictate to those who earn their living from the land; how they are to do their work? This part of the country never has been nor ever shall be, under existing climatic conditions, suitable for agricultural pursuits; and I regard it as nothing short of disastrous that so much land has been denuded of timber and natural feed in order to bring it under the plough. The driftsand, which is becoming such a serious question, is mainly due to the above, and unless this is speedily recognised and an effort made to stop the process we shall find that for every acre brought into cultivation ten will be destroyed by drift. The position is thus narrowed down to the fact that the only thing we can do is to engage in these pursuits as a hobby, and not with any idea of profit. Whilst gardening and poultry raising are interesting and healthy pursuits, and forming pleasing relaxation from our ordinary business, there are several other industries which might profitably and pleasurably engage our spare time. The other day I bought two flower pots at 9d. each, also a bread crock, for which I had to pay 10/6. The material of these was common clay, perhaps worth 1d., and the labour and cost of making was very small. It would be a very interesting hobby for any one to get a work on pottery-making, and experiment with the different clays in the district, and see if he could not turn out a few articles of every-day use. The cost of a potter's wheel is practically nil, and, provided a man can get the suitable material, the cost of a kiln is very small. I am certain there would be enough demand in this town alone to keep a man employed in his spare time for many a month. Again, how many of us grow seeds? We all know how small a quantity of seed, either flower or vegetable, we get for 3d. to 6d. I believe that seeds grown in this district would in time give far better results than those grown in places where the rainfall is greater, provided care were taken in their selection. The same applies to plants. If any one would devote his spare time to raising seedlings a market would follow. At present it may be said there is no demand, but that is because there is no supply. Any one who wants plants or seeds buys the former in Adelaide and the latter at the same place or at the local store, simply because you can't get them elsewhere. Tanning is another recreation which could be profitably indulged in. Kangaroos, wallabies, opossums, and euros are all caught locally, and the wattle tree flourishes, but has any one seen even a rug produced locally? I have enumerated only a few pursuits which I believe might be pleasurably and profitably indulged in; but, in conclusion, I would like to throw out one item as food for thought. At a Bureau meeting a farmer or gardener is expected to tell all he knows as to the condition of anything he may grow or exhibit. He opens his soul, so to speak, and confides his methods and procedure to his confreres. This is expected. Now in this branch we have a number who make their living by some handicraft. It may not be possible for them to give us here an exposition of their work, but suppose they in turn invite us to their respective workshops, the ironworker can show us how to weld iron and temper tools, he can explain and demonstrate the art of shoeing a horse; the whitesmith can give a practical exposition of the use of the soldering iron, and the uses and reason of the fluxes employed; the woodworker can show the advantages of dovetailing over nailing, and the use and abuse of the gluepot; and so on with all who do not get their living from the soil. The farmer gives his knowledge without stint to those not engaged in working the soils; how will it be for them to impart some of their knowledge to those who do.

Saddleworth, July 18.

Present—Messrs. J. H. Frost (chair), G. Benger, J. P. Daley, J. H. Eckermann, W. Hannaford, W. Heaslip, F. Plueckhahn, J. Scales, F. Waddy, F. Coleman (hon. sec.), and one visitor.

Question Box.—A number of questions were asked and answered.

Stock Inspectors.—Members were advised that the services of the Inspectors of Stock were available free of charge.

Local Fertilizers.—Members were unable to say whether locally manufactured fertilizers were better than the imported, as few had tried both. [The analyses published by the Inspector of Fertilizers show which manures are of the highest quality.—Ed.] For wheat some members preferred a slower acting manure than for hay crops. On black land guano super. was much approved of; on red land mineral super. or Thomas phosphate are favoured.

Wheat Standard.—This branch favours the standard sample of wheat being fixed not later than December 15 in each year. Most members were in favour of a 62-lb. standard.

Calves as Vealers.—It was considered unprofitable to raise young bull calves as vealers where pigs are kept.

Stubble Burning.—For early green feed stubble burning was recommended by some members.

Late Fallowing.—Late fallowing is considered inferior to early fallowing for the following reasons:—There is less opportunity for weed seeds to germinate, less rain reaches the subsoil; there is less circulation of air and moisture and opportunity for inert plant foods to become converted into soluble forms by the action of microbes and ferments. Instances of greatly increased yields due to early fallowing were given by several members.

Fertilizers Injuring Seeds.—In respect to probability of the germinating powers of seeds being injured through contact with fertilizers, most of the members were of opinion that under ordinary conditions with the light dressings generally applied the seed would not be injured.

Discussing the Journal.—Mr. Adams read a paper on "Hints on Method in discussing The Journal and Improving the Meetings of the Bureau:"—

> Arranging the subjects of The Journal roughly, we find them under the following heads.—Cultivation. Seeds: varieties, qualities, and treatment for diseases. Fertilizers: composition, qualities, and uses. Harvesting: hay, wheat, and other crops. Implements and machinery. Improvements: buildings, fences and gates, dams, &c. Fruitgrowing and vinegrowing. Horse stock: breeds and health. Cattle: breeds and dairying. Pigs: breeds and bacon-curing. Sheep: breeds and wool. Poultry: breeds, diseases, and rearing for market, &c. Forestry: hedges, fodder plants. Noxious weeds and plants. Miscellaneous, including costs, markets, and general information. This arrangement makes a total of 15 divisions into which the work may be divided, making a subject for each one of a Bureau of 15 members. The importance of the various divisions will not be equal in the minds of every person, nor will they have the same value in every locality, but it is very obvious that any systematic method of work, if carried out earnestly, is of considerably greater benefit than a haphazard and indefinite course of procedure, and will be immensely more effective and complete as well as more pleasurable to all concerned. Let the work of searching out the various points of interest be arranged on the plan of a subject or division of a subject for each member; then the one whose special duty it is to look for, say, cultivation of the land, looks for anything to be found on that particular subject, and if he is not impressed with any one's views as expressed in some portion of The Journal, either for or against, let him state to the meeting his approbation or otherwise of that particular view of the subject, and so lead a discussion on that point. These discussions should be limited to, say, five minutes, as if too long the time required for other topics would be trenched on; but if thought expedient any topic might be made the subject of a specially prepared paper or speech for a future meeting. The member in charge of a subject or division of a subject could prepare himself to answer questions on his particular topic, and look up any special point which may not be satisfactorily answered at any meeting offhand Of course, this implies a "Question Box," which is a capital plan for eliciting information, and for directing special attention to important subjects. The member whose duty it is to look up the question would make every endeavour to arrive at a complete solution of any question to any reasonable extent, for his own information as well as for the benefit of his fellow-members. In addition to the discussion of The Journal, the members who have special charge of any topic should make that subject a special study, and be called upon from time to time to contribute a specially prepared paper or speech on the topic. Of course, all members would read any portion, or all of The Journal, as time or inclination may impel them to do for their own information. The one great argument in favour of the systematising of the study and discussion of The Journal is that the work would be in that manner allotted to some one, and not left to chance or caprice, and there would be no overlapping nor missing of any needful point of interest. It would not necessarily mean that every member must study every subject or division, but every member would, by this plan, have some assistance from at least a section of his fellow-members in the study of the subject he desires to become more acquainted with.

Port Germein, July 19.

Present—Messrs. G. Stone (chair), E. G. Bleising, H. Kingcome, D. Thomson, W. Holman, W. Head, A. H. Thomas, J. K. Deer, J. R. Gluyas, C. O'Loughlin, and G. F. Steinthal (hon. sec.).

General Secretary.—Regret at the resignation of Mr. Molineux and appreciation of his work were expressed by the members.

Fertilizers.—The hon. secretary read extract from The Australasian dealing with fertilizers, and an interesting discussion ensued. Local experiences in the use of fertilizers were well ventilated.

Pyap, July 16.

Present—Messrs. W. C. Rodgers (chair), J. Holt, J. Bowes, W. Axon, E. Robinson, C. Billett, F. Thiele, G. H. Mills, B. T. H. Cox (hon. secretary), and three visitors.

Vitality of Vegetable Seeds.—Mr. Robinson read extract from Journal dealing with this subject, and an interesting discussion ensued. The members were generally of opinion that two years was quite long enough to risk keeping vegetable seeds.

Thin Seeding.—Members were of opinion that as the rainfall was so deficient in this district thick seeding of wheat was not advisable.

Planting Vines.—In reply to question as to treatment of vine cuttings, members were of opinion that it was best to bury the vines until springtime, and then plant out 6 in. apart in rows and water well during the summer. For planting out in the vineyard 9 ft. by 9 ft., or 10 ft. by 8 ft., with intermediate roadways was favoured.

Booleroo Centre, July 18.

Present—Messrs. W. H. Nottle (chair), Dr. Steven, J. Repper, S. T. Parsons, and F. McMartin (hon. sec).

Annual Report.—Ten meetings held during the year, with average attendance of over nine. Eight papers have been read and discussed.

General Secretary—Regret was expressed at causes necessitating the resignation of Mr. Molineux, members being of opinion that his services had been of great value, not only to the members of the Bureau, but to the producers of the State generally.

Keeping Land Clean.—The Chairman initiated discussion on this subject. He only crops his land once in three years, and keeps sheep to graze on it, and yet finds weeds like the native poppy, sheep weed, and others on the increase. Mr. Repper considered the late rains and dry spring weather experienced of recent years were to a great extent responsible for the weediness of the wheat crops. Mr. Parsons was fallowing this year with the scarifier, his object being to cover the seeds of weeds only to a shallow depth to induce germination, and then rework the land to clean it.

Brinkworth, June 20.

Present—Messrs. A. L. McEwin (chair), J. F. Everett, W. Welke, H. J. Welke, A. W. Morrison, W. H. Pearce, J. Cross, J. Stott (hon. secretary), and four visitors.

Officers.—Messrs. A. L. McEwin and J. Stott were re-elected Chairman and hon. secretary respectively, and Mr. J. Cross elected Vice-Chairman.

Complete Harvesters.—At previous meeting Mr. Morrison read the following paper on this subject:—

As we are always on the watch for the best way to carry out agricultural operations, I will give my experience of the harvester I purchased last year. I am quite satisfied with the working of the machine. The draught is no more than many of our ordinary strippers, four horses working it easily, the machine bringing in the grain in a splendid marketable condition. I would not like to go back to stripper and winnower. I cannot complain about loss of grain; in fact, I am sure I gained in this respect, and never had a better cleaned sample. We had no headings to bother us, as they had to go back till beaten out. We stripped and cleaned with the machine 131 bags of red straw wheat, and all the offal we had was one half bag of small wheat. This variety was affected with rust. Dart's Imperial, which was not so much affected with rust, had less offal, and the harvester made a splendid job of it. We saved the greater part of the chaff, and by a little more fixing up could save the lot. We started very early in the morning, and often it was so damp, the chaff would not leave the rib of the head, and on picking some of it off and rubbing it in the hand there was no grain to be found. The machine is so simple and strongly built that I see nothing in the way of its lasting for years. It has cost me nothing for duplicates, and is as good as when purchased. I thought the dust and chaff would be very troublesome, but as it is blown out in rear away from the driver, it is no worse than from an ordinary stripper. In my opinion, the harvester is the coming machine. I do not say that a man having good machines is going to throw them away and buy harvesters, but as the ordinary machines get worn out, replace them with the harvester. It has been said that it will do away with a lot of labour, but the same has been said about every labour-saving machine that comes on the farm. I hold that the firm or man who brings out any machine or implement that will do its work well and lighten the labour on the soil goes a long way to settle the vexed question of how to keep the boys on the farm.

Members on the whole were decidedly favourable to the new machine, but hold that if a farmer has a stripper in good order it would be a mistake to discard it and cast aside a machine representing a considerable amount of money.

Inkerman, July 17.

Present—Messrs. J. Sampson (chair), A. Tozer, F. C. Smart, W. Board, D. Fraser, R. Kennedy, W. W. Mugford, J. Lomman, C. E. Daniel (hon. sec.), and one visitor.

General Secretary.—Regret was expressed at resignation of Mr. Molineux, who, in the opinion of members, had done a great work for the farmers of the State.

Horses.—Mr. Lomman initiated discussion on the horse to keep and horse not to keep. He considered that the horse they should keep should be one that you could lay a board on its back and touch the rump, wither, and poll. This horse, properly broken and handled, will prove staunch and reliable. The farmer should not keep the horse with full glassy eye, arched neck, high step, flash, showy look, and with head carried high. Such a horse is seldom staunch, and although it may get over more ground in a day than the other it will look the worse at night, and if spelled for a few days the plough will have to be pulled out of the ground before he will start. Great care should be given to the selection of both sire and dam for breeding purposes. Mr. Kennedy also objected to the horse holding his head high when starting, but liked an animal with arched neck, fine head, and bright eye. Mr. Smart said the farmer with a limited number of mares and the class of stallions travelling the district had little choice in the matter. Mr. Lomman said he found the level topped horses usually had good shoulders for the collar, whereas one with arched neck and high wither generally had wedge-shaped shoulders. Members agreed that the State was losing ground as regards draught stock, through absence of importations of good animals.

Water Supply.—It was agreed that the district would benefit immensely from a permanent supply of water, and it was decided to support proposals to secure water from the Barossa scheme.

Reeves Plains, July 18.

Present—Messrs. W. H. George (chair), J. G. Folland, W. Cawrse, E. Hancock, R. H. Oliver, H. Day, W. Day, A. Arnold, M. Rechter, J. McCord (hon. secretary), and several visitors.

Fallowing.—Mr. W. Day read a paper on this subject to the following effect:—

To grow wheat or hay successfully in this district it is necessary to fallow. The land must be ploughed or loosened up in some way, so that it can absorb and retain the moisture. Plough any sticky or loose soil before the winter rain, as the work is more easily and quickly done then, the horses being stronger, and the days longer. I do not recommend ploughing dry in sandy soil, as it does not work as well afterwards. After seeding is finished, fallowing should be commenced as soon as possible. To get over the ground quickly while it is wet, and ploughing is heavy work, scarify the ground, especially stubble land, as the latter does not plough very well when it is loose and wet. Scarify it once, and then leave for a month or six weeks before going over it again. If you want to work the ground deeply, take up every other tine in the scarifier to reduce the draught. It will do just as good work this way, the main object being to loosen the ground and bury any seeds. I do not think it necessary to plough or scarify more than three or four inches deep. After fallowing is finished, or perhaps before, harrow well. Harrowing is very beneficial if done at the proper time, as it not only kills a lot of weeds, but helps to get the fallow in good order. I do not favour rolling fallow unless it is ploughed late, and is dry and cloddy. Even then harrows will do more good if worked after a rain sufficient to soften the clods. I do not think after working of fallow is necessary, except to keep the weeds down. A scarifying is quite sufficient if done in October, but early fallow will generally want more than that. Sandy or light land should be worked as little as possible -- it is better to fallow it later than heavy land. Do not work the fallow when it is dry and dusty if it can be avoided. We often get some showery weather or a thunderstorm in the summer, and any working that is necessary should be done immediately after rain. Much depends on the sort of plough used in fallowing on the different sorts of land. Most of us are used to the long mould board and coulter, like those on Howard's and Ransome's ploughs. I think these are quite unnecessary, a short board being far before them. It will turn the work quite as well, and break the soil up much more, saving a lot of labour, and making the draught much lighter. Another thing, most ploughs are made too heavy; quite out of proportion of the work that is required of them.

Mr. Hancock did not believe in dry fallow; far better results were obtained if the land is ploughed when wet. Working was the main thing; fallow land could not be worked too much. He would keep the harrows right up to the plough. Mr. Arnold would have fallowing finished by the end of July, but did not believe in too much working. He thought 3 in. deep enough to plough. Mr. Rechter said dry fallowing gave good results, but the land would require a great deal of working when wet. Scarifying would do on light land, but not on heavy soils. The newer ploughs were lighter and better than the old-fashioned kinds. Mr. Folland admitted that early fallowing gave the best crops, but if much stock is kept early fallowing is impossible, as the feed did not grow until late. He did not believe in deep working. Mr. Oliver found scarifying made more work than ploughing, but it was the best way to clean the land. He believed in summer fallowing. The Chairman said everything depended on the soil to be treated: different soils required to be worked differently. August was time enough to finish fallowing. Mr. H. Day did not harrow sandy soil, nor did he agree with the paper as to summer fallowing. He did not think the fallows could be worked too much.

Redhill, July 15.

Present—Messrs. D. Lithgow (chair), R. T. Nicholls, C. Brown, R. H. Siviour, A. A. Robertson, F. Wheaton, D. Steele, J. N. Lithgow (hon. secretary), and one visitor.

Improving Usefulness of Branch.—Mr. Brown thought that to increase the interest of the general public in the work of the Bureau, and to give outsiders a chance to learn the aims and objects of the institution, it would be a good plan if two or three of those longest on the roll retired each year, and the vacancies were filled by gentlemen nominated by the public. If visits to neighbouring branches could be arranged occasionally the meetings would be more interesting and instructive. Some of the members failed to see that any good would result from the adoption of Mr. Brown's suggestion. Members did not think any advantage would be derived from the notification of day of meeting in The Journal of Agriculture as often, owing to various causes, the dates had to be altered.

Port Elliot, July 19.

Present—Messrs. J. McLeod (chair), H. Welch, H. Green, F. Basham, W. W. Hargreaves, S. Inglis, H. Gray, and J. Brown (hon. secretary).

Conference.—It was decided to arrange for Conference of Branches at Port Elliot on August 16, and to invite officers of the Department of Agriculture to attend. Several papers were promised, and the co-operation of all the surrounding branches of the Bureau is sought.

Shearing Sheep.—Mr. Basham read a paper on this subject to the following effect:—

He did not suppose his method of shearing the only right one, or the best, for he had seen many different shearers at work, and hardly two shear alike. To make the sheep look well after being shorn, and to keep the fleece the least broken, he found B.B. or T.U.S. sheepshears best. The blades should be as straight as possible, and tempered well down. Fit them up with a driver, &c.,, and grind with a flat and even bevel on each blade. Select a turkey stone with as many small white specks and little holes like as if it had been stabbed with a pin as you can get. Use plenty of oil when sharpening. Having good sharp shears, catch the sheep, stoop down and place your arms round its body, and carry to the shearing board, and sit it up on its rump, facing the way you want it to go when shorn. Place the forelegs at the back of your left arm, and keep the animal as upright as possible. Use the shears in the right hand, commencing at the lower part of the brisket, and shear in an upward direction. When you have the brisket nicely cleaned, turn your right elbow in towards your ribs, and run from the right of the brisket with a wide blow down to the flank, with both blades under the wool, and break it out with the hand that you have the shears in. Then commence shearing across, below the brisket, and go across to the near side about the same distance as you shore down on the off side. Take the belly fleece in the left hand and break it off and lay it aside, to be removed by the woolpicker Then clean out the crutch, and shear over towards the tail as far as you can reach easily. Clean the inside of the off hind leg, commencing at the hoof and come down toward the crutch Take as large a blow on all trimmings as you can, and by no means shear across any of the legs, or it will make them look very bad. Commence also at the hoof of the near hind leg, and come down on the outside, and shear over the hind leg. Turn your elbow in and shear up toward the hoof on the inside of the near leg. Then place your right foot between the sheep's hind legs and the left leg at the back of the sheep, with your foot well under its rump. Allow it to lean a little forward. Place its off fore leg at the back of your right leg. Take hold of the sheep across the nose with the left hand, and the neck of the sheep across your leg above the knee. Commence shearing at the top of the brisket. Keep both blades under the wool. Shear up the side of neck, and run the shears out under the off ear. Then break it out with the shears closed in your hand. Work around the neck by commencing also at the top of the brisket, with all blows running up to the head, until you have shorn to the back of the neck. Shear across the shoulder within about two or three inches of the centre of the back. By going too far the fleece is often cut through with the shears, and also by going too far over while going down the first side of the sheep, especially if you are shearing heavy woolled merino sheep, the weight of the wool hanging that you have shorn off the first side will break down the centre of the fleece. When you have shorn down to the rump, then shear well over the rump and tail Lift the wool that you have shorn off the lower part of the sheep with the points of the shears, and lift it away to the left. By doing so it places that part of the fleece in the right position for picking up, and also prevents treading upon the fleece Place your right foot over the rump of the sheep. Let the sheep lay a little on its right side, and commence shearing at the rump, and shear up the back of the sheep with two or three wide blows. When you have shorn well over the backbone, rise the sheep in an upright position. When shearing on the body of the sheep keep the top blade of your shears well down on the sheep's pelt to avoid making ridges, and also keep the heel of the shears low to avoid leaving little bunches of wool and cutting the wool twice. He found if he did not keep the thumb of the right hand well down on the body of the sheep as a sort of a gauge to prevent you from making uneven blows, it was an easy matter to rise your hand and cut the wool high with one chop, and lower your hand and cut the wool low with the next chop. When you have risen the sheep, place its head between your legs and go down the off side and finish on the off hind leg If the woolpicker understands his work, the fleece will be in a good position for picking up and putting on the wool table.

Nantawarra, July 16.

Present—Messrs. James Nicholls (chair), R. Nicholls, T. Dixon, jun., G. Belling, E. J. Herbert, A. F. Herbert, S. Sleep, J. W. Dall, R. Uppill, A. L. Greenshields, H. J. Spencer (hon. secretary), and three visitors.

Woolclassing.—On July 3 Mr. George Jeffrey gave an address on wool and sheep, and steps are being taken to form a class on woolclassing under his supervision.

Horsebreeding.—Mr. Belling said he noticed a correspondent in one of the daily papers criticising paper read by him at previous meeting. His critic stated that third-rate stallions often produced good useful horses from inferior mares. Mr. Belling considered if this was his critic's actual experience he had better luck than any other horsebreeder he had come across.

Horse Complaints.—Mr. Greenshields said one of his horses was suffering from swollen glands in the neck, different, however, from strangles. It could eat a little green feed, but not without coughing. It cannot swallow water, and the breathing is heavy. [Chief Inspector of Stock advises applying hot fomentations to neck, and to sprinkle a few drops of carbolic on hot bran for the animal to inhale. Put 2 to 3 drams nitrate of potash in bucket of drinking water. If swelling is persistent apply blister.—Ed.] Mr. R. Nicholls had a horse doing ordinary farm work which, even when simply driven to the paddock, pants very badly. It has been fed on hay, rather rusty, for four or five months, and he wished to know whether this was likely to be the cause. [Mr. Valentine thinks the dry rusty hay has brought on a tendency to broken wind, and advises change to succulent feed.—Ed.] The hon. secretary referred to enquiry from Pine Forest Branch re "bandy legged" horses, and thought complaint the same as described in report of Nantawarra Branch in September, 1901, issue of Journal of Agriculture, page 192.

Annual Report.—Ten meetings held during the year, with average attendance 9.2 members and 3.4 visitors. Six papers read and discussed. Meetings generally have been well attended and instructive. Officers thanked and reelected

Pickling Wheat. Report of Koolunga Branch in July issue of Journal of Agriculture dealing with difficulty of floating off bunt balls when pickling in cask was referred to. Several of the members of this branch have pickled their seed wheat in this way, and float out nearly all the bunt balls; they have the pickle in a tub, and let the wheat run gently in. If bunt balls are loaded with wheat they cannot rise and be floated off.

Pruning of Vines and Fruit Trees—Mr. O. Uppill, a visitor, read a paper on this subject to the following effect —

In starting to prune a young tree it is usually considered necessary to retain about three of the best young shoots to form the crown If the branches on the tree received from the nursery start higher than 18 in. or 2 ft. from the ground, cut them down to that height. This would perhaps appear to throw the tree back a little, but it would be found to be the better plan in the end, as the tree, if left on a long stem, in a few years would be quite out of reach, having a long, bare, useless stem, with the top exposed, which would eventually be broken down by the wind. Next year leave two shoots on each of the shoots of previous year's growth, and keep the six going till you have 12, when you can consider your tree formed In cutting back these shoots each year it is always advisable to cut off where there are two wood buds, one pointing towards the centre of the tree, and the other outwards. [This position for buds should only be adopted after the third year—Ed.] Thus the tree will be kept the right shape and evenly balanced. Up to this stage the same thing would apply to almost every kind of fruit tree. At three years the tree should be fairly shaped, and apricots and peaches will usually start bearing. The pruner must then begin to look after the fruit wood. If a shoot has no further buds on it, it should be cut back to one bud, and the following year it will throw out a good fruit-bearing shoot. After the peach has been bearing a few years it will be necessary to reduce the fruit spurs wherever possible, so as to keep the tree from running itself out. [It is important that this should be attended to from the very first year—Ed.] There is a good deal of difference in the pruning of apricots and peaches The peach bears its fruit on the previous year's wood, and the wood will only bear once. In shortening back spurs great care should be taken to cut off at a wood bud Otherwise the spur will die back. In leaving spurs on any kind of tree do not leave too strong a shoot, as if cut for a spur it will probably throw out an even stronger growth, and rob the main limb of the tree. The apricot bears its fruit on spurs thrown out on the previous season's wood. It may be necessary to top back some of these spurs a little or so as to prevent the tree from overbearing. The pruning of the spurs should be such as to induce from them a good growth of new fruit wood for the following year When the tree gets from 7 to 10 years old it will be necessary to shorten back and thin out the fruitbearing wood.

The principles referred to for the shaping of apricots and peaches to a certain extent apply to most other fruit trees. Apples, pears, plums, and quinces, after reaching the stage mentioned in the early part of my paper, will need very little pruning at all, as if planted in rich soil and pruned to any extent it will perhaps be a difficult matter to get them to bear. It will be necessary to keep the main limbs going in the right direction, taking out any limbs that cross each other, and thinning out a little. If grown on poorer land, it may be necessary to shorten back the main growing limbs more after the style of an apricot. I would consider June and July the best time for pruning: the apple, pear, and plum may be dealt with a little earlier without much disadvantage accruing; but with the peach and the apricot late work has its adantages, as in pruning the apricot spurs the wood buds can be more readily detected.

Vines.—A vine should be started with two shoots about 6 in. from the ground. These shoots can be cut back, leaving two buds, cutting through the centre of the third so as to keep any dampness from going down the centre of the wood and killing the end of the spur. The following year there will in all probability be four shoots which should be cut back as before, and the following year about six may be left. This, of course, will depend upon the strength of the vine. It may be necessary to leave more or less. At this stage the vine will be nicely formed, and will only require one spur to be left on each of the previous year's pruning. If possible, always take off the top one of the two shoots, cutting out the piece of previous season's wood down close to the spur that is left. By doing this the vine can always be kept back, giving it more vigour, and not allowing it to get away into long and useless branches that would be in the road of ploughing, and exposed to the wind. In rod pruning the rod or rods should always be left on a piece of wood that can be taken out the following year. The rod should be left long enough to be taken over the centre of the vine in a circle and tied to the butt. Thus the grapes will hang nicely underneath, and will be well sheltered. In leaving two rods they will not require to be left quite so long as the one, and will be brought over the vine as in the other case, and the two ends tied together in the centre. A vine that is rod-pruned will not require as many spurs as one that is spur-pruned. Enough should be left to keep the vine in shape and allow for the rods to be left the following season. Rod pruning is applied principally to shy bearing varieties. A water shoot should never be left for a rod or spur, as they will not bear till the second year. In cutting them out, or any other growths from the main stems, always cut as closely as possible, so as to take off any eyes that are at the butt of the growth, as these, of course, if left, will grow again the following season, and will to some extent rob the rest of the vine that has to bear the fruit.

In the discussion which followed the question of summer pruning was referred to. It was agreed that to secure success in this district fruit trees must be given plenty of room. Mr. Uppill has planted his 27 ft. apart on the square, but would now advise planting at least 30 ft. each way. Some members' trees were dying, the dry seasons and salt at the roots being blamed. Mr. Uppill, sen., said that even in this locality fruit trees would prove longlived if planted far enough apart, and the land was well cultivated.

Mount Remarkable, July 17.

Present—Messrs. C. E. Jorgensen (chair), W. Lange, T. P. Yates, W. Foot, J. McIntosh, and J. O'Connell (hon. sec.).

Central Bureau.—A vote of thanks was accorded to the members of the Central Bureau for the work they had done to advance the agricultural interests of the State, and regret expressed at the necessity for the alterations that had been made. The Chairman appealed to the members to do all in their power to advance the interests of the Bureau, and to collect information for publication in The Journal of Agriculture.

Manures and Fodder.—The hon. secretary read extracts from The Australasian dealing with the use of commercial fertilizers, and the conservation of wheat chaff, straw, &c. An interesting discussion ensued.

Tobacco.—The Chairman read account of visit to the tobacco growing districts of Victoria, and stated that he had grown good tobacco at Moppa, and was convinced that it could be grown successfully in the gullies around Mount Remarkable. It was decided to procure seed of tobacco, one member offering to carry out experiments.

Koolunga, July 17.

Present—Messrs. T. B. Butcher (chair), J. Button, E. J. Shipway, J. Sandow, R. Lawry, C. J. Allen, W. T. Cooper, G. Jose, J. Pengilly, J. W. Atkinson, W. Aunger, J. C. Noack (hon. sec.), and three visitors.

Meetings of Bureau.—It was decided that in opinion of members economy might be effected in the working of the bureau by having the dates of meetings inserted in The Journal instead of each hon. secretary notifying the individual members. [Hon. secretaries have already ben asked to notify me of dates of meetings of the branches.—Ed.]

Agricultural Plots.—A handsome framed certificate was presented to Mr. J. Sandow as winner of prize offered for the best agricultural experiment plots in the district.

Agricultural Education.—Mr. Sandow read a paper on this subject. He contended that the farmer requires a good education to be successful, and the

State should do what it can to give the younger generation facilities for securing such education. He claimed that the Agricultural Bureau had done more than any other organization to improve our system of farming. They had a good Agricultural College, but he thought it should be kept provided with the best and most up-to-date implements. There was also an Agricultural School in Adelaide, but to him it always seemed a mistake to have this in the city instead of in an agricultural centre. Then they had school teachers giving lessons in agriculture, but he thought the whole system was wrong. These institutions, if properly worked, would doubtless do much good, but unless they were placed under the control of properly trained, as well as practical men, they would not be a success. The members of the Bureau might assist in the work if the Department would provide suitable plots of land, as well as materials for experiments. If this were done he had no doubt that members would be prepared to lend ploughs and teams, and also to instruct the boys in the practical work. Several members opposed the idea of the public schools taking up the teaching of agriculture, considering that owing to the manner in which the work was done it could not possibly result in much practical benefit.

Kanmantoo, July 21.

Present—Messrs. T. Hair (chair), P. Lewis, W. G. Mills, F. Hair, J. Downing, and F. Lehmann (hon. sec.).

Agricultural Education.—An animated discussion took place on the objects of the Agricultural School, and the opinion was expressed that if such a school was carried on on proper lines and brought prominently before the farmers it would soon become self-supporting, as they would be glad to avail themselves of the opportunity of giving their sons a good education, particularly in respect to scientific agriculture. The absolute necessity for such a school was admitted by the members.

Riverton, July 19.

Present—Messrs. W. Hannaford (chair), Dr. Glynn, A. J. Davis, D. Kirk, F. M. Calf, M. B. Davis, J. W. Kelly, T. Gravestack, Elliot Kelly, H. A. Hussey (hon. sec.), and three visitors.

Annual Report.—The hon. secretary gave his ninth consecutive annual report. Eight meetings had been held, with an average attendance of about eight members. Two papers had been read, and various matters of practical interest discussed. One important point taken up during the year is the manuring of pasture lands, experiments being undertaken by two members, under the supervision of the Inspector of Fertilisers. The manuring of vineyards is also being tested by local vignerons. Mr. Hussey was thanked for his services, and elected Chairman and hon. secretary for ensuing year, Mr. W. Hannaford being elected Vice-Chairman.

Soils.—Mr. Hussey read a very interesting paper on "Mother Earth—Varieties and Constituents," culled from various authors, and arranged with notes having reference to local conditions. The paper was greatly appreciated by members, who accorded Mr. Hussey a vote of thanks for the trouble he had taken in preparing the paper. [We are pleased to note the interest taken in this subject of late by quite a number of bureau members. Such papers cannot fail to result in good, and we regret that we cannot publish them all. The members are, however, to be heartily commended for their zeal in their self-imposed labours for the benefit of their fellow-members.—Ed.]

Stock Complaint.—The hon. secretary tabled piece of bony matter taken from the gums of a horse. It weighed 2¼ oz., and although detached from the teeth the substance appears to grow while under the gums. Several similar growths have been removed from horses' mouths of late in this district.

Season.—Members reported that the season had been very dry and cold; severe frosts have retarded the growth of the crops and feed. Nice rains have, however, been recorded this week. Record for six months ending June 30, 8.26 in.

Clare, July 11.

Present—Messrs. W. Kelly (chair), G. Lloyd, S. C. Bray, H. Carter, and W. S. Birks (hon. sec.).

Agricultural Education.—Mr. H. Adams read a paper on "The Teaching of Agriculture in South Australia." He traced the gradual improvement in agricultural operation, the establishment of the Roseworthy Agricultural College, and the work done by that institution. The work in connection with agricultural education carried out in different parts of the country at the public schools was also referred to. At present, owing to the haphazard way in which the work had to be carried on, the teachers were hampered, and the results were not satisfactory. Properly trained teachers for the agricultural schools were necessary, and funds were required for experimental work. The Agricultural Bureau had done splendid work, and he thought there was much to be said in favour of Mr. Grasby's suggestions for reading courses, circulating libraries, lectures in connection with the branches. There is one thing which the various bureaus might do, and that is to endeavour to create in the minds of the people generally, and of the governing bodies in particular, the absolute necessity, as well as the immense benefit to the State and the people, of the further development and extension of agricultural and scientific teaching in every shape and form. It is certain that when the public do become alive to the pressing need of the time there will be such a "push on" given to the much-to-be-desired work as will assist very materially to lift South Australia and its people out of this condition of agricultural and general depression., and place this State in the forefront of successful countries. The extension of agricultural teaching will necessitate the expenditure of more money than is now spent; but besides being a fair and right use of public money it will also give direct results, as well as assist in bringing about a more prosperous condition in general, and so be a judicious as well as necessary outlay.

Port Broughton, July 11.

Present—Messrs. W. R. Whittaker (chair), G. Pattingale, A. Button, W. J. Dalby, and J. Harford (hon. sec.).

Sand Drifts.—Mr. Dalby read a paper on this subject to the following effect:—

There was the good side as well as the evil of sand drifts. Fallow is one of the principal causes of drift; the object of fallowing was to keep the land free of vegetation for the season, and the earlier in the winter it is ploughed up the better. It must be cultivated to keep the land in condition to enable the farmer to commence seeding before rain the next season, if necessary. In this district fallowing is both a boon and a drawback, as their sandhills drift badly. This drift over the flats forms a mulch and does the land good, the moisture being retained longer than otherwise would be the case, resulting in better crops being obtained. Unfortunately there is the evil side of the question. The sand does not stop on the flats, but drifts over fences and on to the roads, doing considerable damage. In many cases the chain roads are in a deplorable condition from this trouble, and something must be done to prevent what will certainly prove a serious calamity. If the present system of fallowing is continued the flats will in the course of 15 years or more become covered 6 or 7 in. deep with sand, and when this happens there will be nothing whatever to check the sand. Fences will be covered, roads blocked, and other damage done. As to effective remedies there was much divergence of opinion. The drift was, in his opinion, largely due to the destruction of the root fibres and humus, leaving nothing to hold the particles of sand together. The wanton destruction of timber allows the summer wind free scope. We have no timber reserves in this district, and some of those who first clamoured for the disposal of the timbered lands are now loudest in advocating tree planting by the Government. If the sandhills are left unploughed, and the grass is allowed to grow and mature, they will not drift. Ploughing in a good coat of grass and old straw would materially help in stopping drift, and if this practice were continued for some years he did not see why the hills should not become fixed, as was the case when they were full of leaves, roots, and fibres of bushes and trees which originally grew on them. If, however, feeding the land bare before ploughing and burning stubble, &c., is continued the sandhills will continue to drift.

Discussion ensued, members generally being of opinion that Mr. Dalby had grasped the main points of what at present is a very serious position. Mr. Pattingale thought that grazing sheep, which broke the surface crust, was largely to blame for the trouble.

Scales Bay, July 19.

Present—Messrs. J. Roberts (chair), A. Plush, A. Newbold, R. S. Thomas, G. Newbold, E. R. Aitchison, D. P. Thomas (hon. sec.), and four visitors.

Eaglehawks as Rabbit Destroyers.—Mr. R. S. Thomas reported that the previous day he had visited an eaglehawk's nest, and saw fully a hundred rabbit skeletons beneath the nest. Mr. Aitchison had seen a nest on his land, and believed there were more than a hundred rabbit skeletons beneath it. Mr. Plush also had noticed the good done by eaglehawks.

Damp Super.—Mr. Plush had noticed statement in The Journal of Agriculture that the best material for mixing with damp super was sheep manure treated with sulphuric acid. He wished to know what proportion of acid should be used, and where to secure the acid.

Season.—The weather during the early part of July was very cold and dry, heavy frosts prevailing. Fine rains have since been recorded, but there is as yet no feed to speak of, and the crops are very backward.

Appila-Yarrowie, July 18.

Present—Messrs. P. Lawson (chair), J. C. W. Keller, A. Fox, J. Wilsdon, J. H. Bottrall, N. Hannagan, J. Daly, E. Catford, G. A. A. Becker, W. C. Francis, C. G. F. Bauer (hon. sec.), and two visitors.

Annual Report.—The hon. secretary's report showed that during the year seven meetings were held, with an average attendance of nearly eleven members. The second show of products of the district was held in March, and was very successful. A public trial of cultivators was also successfully carried out. No papers had been read during the year, and visitors were few; in both matters he hoped there would be a marked improvement during the coming year. Mr. Bauer was thanked for his services, and re-elected hon. secretary. Messrs. J. C. W. Keller and W. C. Francis were elected Chairman and Vice-Chairman respectively.

Harrowing After Drilling.—Discussion on this subject took place, but members differed in their opinions as to whether harrowing was necessary or advisable.

Renmark, July 17.

Present—Messrs. E. Taylor (chair), A. S. Johns, R. Nuthall, F. Turner, R. Kelly, F. Cole (hon. sec.), and three visitors.

Plants for Alkali Soils.—The Chairman read an article by Dr. R. H. Loughbridge, of the California Agricultural College, on tolerance by various plants of alkali, the conclusions arrived at being as follow:—

1. Grapes and olives thus far stand at the head among fruits in their tolerance of each of the alkali salts; oranges grew in a larger amount of carbonate than did the olive, but that salt was chiefly held below the two surface feet. On the other hand, the lemon seems to be the most sensitive to the effects of alkali, especially to common salt, and next to it the orange.

2. The amount tolerated depends largely upon the distribution of the several salts in the vertical soil-column, the injury being most severe in the surface foot, where under the influence of the unfortunate practice of surface irrigation the feeding rootlets are usually found. It is therefore important that in alkali regions such methods of culture and irrigation should be followed as to encourage deep rooting on the part of crops.

3. The amount tolerated varies with the variety of the same plant, as shown in the grape.

4. The amount of alkali tolerated by the various cultures varies with the nature of the soil. It is lowest in heavy clay soils and fine-grained soils in which the downward movement of the plant is restricted; and highest in loam and sandy soils, in which the roots have freedom of penetration.

5. Lands heavily charged with alkali may often be made productive for certain crops by the application of irrigation water in sufficient amount to leach the salts down to a depth of several (5 or 6) feet, and by preventing their subsequent rise by proper mulching or cultivation, until the foliage of the plant itself will prevent evaporation

of the soil moisture from the surface of the ground. Alfalfa culture has thus been made highly profitable in lands once so strongly charged with alkali as to kill all vegetation.

6. The reclamation of lands charged with carbonate of soda by neutralization with gypsum renders possible the profitable planting of such crops, as withstand large amounts of common salt or of glauber salt.

7. Sulphate of soda (glauber salt) is hurtful only when present in very large amounts, most cultures doing well in more than 10,000 lb. per acre in four feet depth; saltbush, hairy velch, alfalfa, and sorghum grew well in more than 61,000 lb.

8. Barley is better adapted to alkali lands than is wheat, for it will withstand the effects of twice the amount of carbonate of soda and common salt. Of course the carbonate may be neutralized with gypsum, and in the absence of much common salt will permit of the growth of excellent crops of wheat, but where the amount of common salt exceeds 5,000 lb. barley should be given the preference over wheat.

Highest amount of alkali in which fruit trees were found unaffected:--

Pounds per acre in four feet depths.

	Sulphates Glauber Salt.	Carbonate Sal. Soda.	Chloride Com. Salt	Total.
Grapes	40,800	7,550	9,640	45,760
Olives..	30,640	2,880	6,640	40,160
Oranges	18,600	3,840	3,360	21,840
Peaches	9,600	680	1,000	11,280
Apricots	8,640	480	960	10,080
Lemons	4,480	480	800	5,760
Alfalfa	120,480	2,360	5,760	110,320

Mr. Johns's experience led him to believe that lucerne would thrive on alkali land once it got a start; great benefit would result from a good flooding before planting to leach out the salts.

General Secretary.—Regret was expressed at Mr. Molineux's resignation, and members testified their appreciation of the work he had carried on for the benefit of the producers.

Pruning Demonstration.—It was decided to arrange for demonstrations by an expert in the pruning of fruit trees, members agreeing to subscribe to necessary expenses in connection with same. It was also decided to invite Prof. Perkins and Mr. Quinn to visit the district for the purpose of giving demonstrations in the pruning of vines and fruit trees.

Pyap, July 19.

Present—Messrs. J. Green (chair), J. Jones, H. Blizard, W. Tuck, C. H. Perry, F. Starr, and J. J. Odgers (hon. sec.).

Orange Trees Killed.—Mr. Green reported that his orange trees were barked under the soil, apparently by a grub; the trees were dying, and he wished to know what insect was the cause. [Only personal examination can show cause of mischief.—Ed.]

Drying Fruits.—Discussion took place on drying and grading fruits, members admitting the necessity for improvement in this direction. Provision for grading and drying fruits at the settlement is inadequate, and it was agreed that members should look into the question during the month and come prepared to deal with the subject at next meeting.

Dowlingville, June 27.

Present—Messrs. J. Phelps (chair), R. A. Montgomery, T. Illman, J. Rooney, J. F. Whittaker, J. F. Burkin, T. Lombladt, G. Mason, F. Lack (hon. secretary), and seven visitors.

Farming in South Australia.—Mr. Montgomery read a paper to the following effect on—"Are We as Farmers Going to the Dogs?"

Most members have doubtless noticed in the May issue of The Journal of Agriculture a report of three papers which were read at branch meetings, the subject of the papers being the cost of growing wheat in this State. First, we have a paper from a member of the Scales Bay Branch, in which the writer, with 400 acres in crop and a 6-bushel average, requires the price of wheat to be 3/ a bushel at Port Adelaide to make a profit of £19. All we can say is that if he cannot do better than that, he should try some other line, as he will soon get to the bottom of his purse, unless it is a deep one. The next paper was read at Mallala Branch, and the cost of growing a bushel of wheat on a 600-acre farm, with a 10-bushel average, brought out at 2/7¾. These estimates of cost, being based on contract prices for work, the Mallala members, considering the estimate about correct, and that the price at which the work can be done by contract. was the correct base for estimating the cost. The third paper, from a member of the Arthurton Branch, who, farming 1,000 acres of first-class land, requires an average of 12 bushels to the acre, and wheat at 2/6, to make a profit of £96 15/. This farm is supposed to be divided into three or more sheepproof paddocks; 300 sheep are kept, also some cows, pigs, and fowls, one-third of the area being fallow each year, fallow only being cropped. Eleven out of fourteen members of the branch voted that the figures gave a fair estimate, contract prices for all the work being the basis.

If the object of the writers of the two last papers is to show that contract farming will not pay, we may congratulate them upon having succeeded fairly well in their object. After reading these papers, surely but few will invest money in farming—better put it in the totalizator, or in shares, as they may lose it sooner; but if they do, at least they will get more excitement out of it while it lasts. When we are told by our fellow farmers that we are to take the price at which farm work can be done by contract as a base for estimating our profit and loss, I think it well worth looking into the matter. You all will agree that what little contract work has been done on farms within the last few years has been done at as low a price as at any previous time. In the two papers the actual cost to the grower is in one case more than the crop is worth; in the other the figures are incomplete, for we find no allowance made for watering and looking after the sheep, cows, pigs, or hens, and as no hay is cut on the farm. Both farms are supposed to be well cultivated. and situated within a fair rainfall, the crop in one instance being 10 bushels, the other 12 bushels. We all know the average here is often below six, and but seldom above eight to the acre, and the price may be put at 2/6, not more. Now, either we must have a cheaper way of farming, or be in a bad, financial position, or the contract test is all wrong. I will give the writers credit for a better mode of farming than the average. I have been farming in South Australia over 40 years —more than half the time on the Peninsula—and have seen many changes in the modes of farming and variations in the price of wheat and other farm products Land has been selling and letting at higher and at lower prices than now; still, at no time was the land more firmly held by those in actual occupation than at the present time. Within the last few years, not in this State alone, but in all the States of the Commonwealth, the Governments have been and are still repurchasing large estates, and cutting them up into small farms and homesteads, in very many instances to be used principally for growing wheat. Then we do not see as many farms advertised for sale and to let as often as in years gone by. Now, if the profit or loss on a farm could be correctly measured by contract prices for the work, in what financial position would we expect to find the average farmer by this time. He would have been sold up long ere this, and his farm once more a sheep walk, or home for the rabbit and dingo. But such is not the case. We still hold our farms. though with dry seasons, red rust, takeall, and the low prices of wheat, most of us have had enough to do to keep our heads above water, but we have done so. I think we are therefore quite qualified in concluding that contract prices for farm work cannot be taken as a test of the profit or loss, as farming is carried on here. Where, to me, it seems the writers of the papers have gone astray is they have overlooked the all-important fact that nearly all the work of the farm is done by the farmer and his family; consequently, the price given for the work would be their earnings, and if all of us farmers were fortunate enough to secure a return each year equal to the schedule of prices given, there would be little fear of the bailiff troubling us. I may be told that the above is all very well when by what we may call home labour the farm is worked, but how is it when wages have to be paid? In that case more capital is required. And to me it seems in such case all the farmer has any right to expect is a return of the wages actually paid, with a fair interest, and interest on his working capital. As a matter of fact, there are but few, if any, farms in this State worked wholly by contract. Then why do our Mallala and Arthurton friends waste time in building mud houses for the pleasure of knocking them down again? If in their fall none but they themselves could be injured, I for one would not object; but in this instance such is not the case. The Journal of Agriculture can be obtained in other States and countries, and where our actual position is not so well known, and if the figures in the papers may be taken to give a fair idea of the cost of growing wheat here, and the financial position of farmers as a body, the State gets a bad advertisement.

An animated discussion ensued, some members being of opinion that while some of the items given in the papers criticised were reasonable, the work as a whole could be done for a less amount than the estimates given. It was resolved that in the opinion of members the papers were not fair estimates of the cost of farming in South Australia.

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of persons registered and found employment by Government Departments and Private Employers from June 30 to July 26, 1902.

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths	146	118	414
Masons and bricklayers	2	--	—
Stonecutters	—	--	3
Tilesetters	2	—	6
Carpenters	4	3	2
Painters	10	—	4
Plumbers and ironworkers .. .	2	--	—
Enginedrivers and firemen	—	1	—
Fitters and turners..	3	—	1
Blacksmiths and strikers	3	—	—
Moulders	1	1	8
Fettlers	—	—	2
Master mariner	—	—	1
Compositors	—	—	9
Saddler	—	1	—
Basketmaker	—	1	--
Cook and sculleryman	1	—	1
Gardener	—	—	1
Apprentices	6	1	—
Cleaners	7	4	—
Porters and junior porters	2	3	--
Rivet Boys	5	—	2
Totals	194	133	454

July 30, 1902. A. RICHARDSON, Bureau Clerk.

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CONGRESS.

In the course of a few days many readers of this Journal will be wending their way towards the metropolis to view the Royal Agricultural Society's Show, and let us hope to take an active part in the fourteenth Congress of the Agricultural Bureau. The organisation of producers scattered over the four corners of an immense territory would not have been carried to its logical end had not this annual general meeting been devised, when the South meets the North and familar names become clothed in flesh and blood. Past Congresses have had their successes, and that fortune may still smile on us at the parting of the ways is a wish that we may devoutly entertain without anticipating with certainty. It is manifest that the success or failure of such meetings cannot absolutely be attributed to organisation, much depends on the character of the work done by members in the past and brought forward in support of the discussions. We realize the difficulties before the present Congress: the old bottles may not withstand the pressure of the new wine. New elements have been introduced, and yet time has not allowed of any modification in general procedure.

To many, Congress will appear shorn of much of its glory; the familar faces of members of the Central Agricultural Bureau will be missed, the enthusiastic Secretary has resigned his position; and last, but not least, our old friend Professor Lowrie, a host in himself, is no more in our midst. Others will not be wanting to fill up the gaps, and we trust that with the cordial assistance of members in general some measure of success will not be denied us. We do not, however, care to disguise the fact that we look forward with greater anticipations to the 1903 Congress than the one about to be opened.

We have already stated that much of the success of the Congress depends on the character of the work accomplished by members in the past; this proposition will bear anticipation. How is it that Congress usually has to record numerous discussions of extreme interest, but frequently no resolutions of real practical value! It does not appear to us difficult to account for this apparent anomaly: discussions must necessarily remain more or less academic in character, and sterile in effect, so long as they are not backed up by careful preparation and the testimony of numerous and well ascertained facts. It may well be urged that members are able to support their views with the experience of their lives. This we do not wish to deny, and in purely academic discussions are prepared to accept such testimony at its full value; we must, however, point out that the experience here referred to is rarely disengaged from the bias of local surroundings, climatic or economic, and that from similar sources it is likely to be opposed by conclusions with diametrically opposite tendencies. We are under the impression—and we offer the suggestion to the Congress about to be opened for what it is worth—that the practical value of discussions would be enhanced many fold were they largely based on work conducted during the course of the year with that special object in view. It is often said and we are prepared to endorse the statement that a tiller of the soil is not as a rule in a position to try experiments with the sources of his livelihood; that he is in a sense compelled to rest satisfied with the bird in hand, however tempting may prove those in the bush

With such a splendid organisation as we possess in the country Agricultural Bureaux we are under the impression that work of an experimental character of real practical value might be set going. It should not be difficult to find certain individuals in different centres willing to carry out the work in conjunction with neighbouring Branches, and under the superintendence of the Department. The only difficulty arises from the collection of the sinews of war, and this question we commend to the attention of the officers' Conference to be held during the coming Congress; that it will lay the foundation for a useful Congress in 1903, is not only our hope, but anticipation.

DEPARTMENTAL NOTES AND WORK.

The first meeting of the newly formed Council for Agriculture took place on the 20th of last month in the Board Room of the Department of Agriculture. All the members were present, and Mr. R. Caldwell was unanimously voted Chairman for the ensuing year. Business was purely of a formal character. It was agreed that the ordinary meetings of the Council should take place on the last Wednesday of the month at 2 p.m. The Council intend visiting the Agricultural College on September 25, at which institution their second meeting will be held. In reply to a question from the Hon. Minister of Agriculture, it was decided to retain Monday after Show week for Farmers' Day at Roseworthy College. The Chairman, Mr. R. Caldwell, has consented to preside over Congress, and deliver an opening address.

At the request of the Royal Commission for the Pinnaroo Railway, Professor Perkins visited the land it is proposed to open out with a view to securing samples of the soil for analysis. These samples are now in the hands of Mr. Hargreaves, the Government Analyst and Inspector of Explosives. Professor Perkins found grass in the open country very backward but no more so than in other neighbouring districts. Some of the land in crop showed fairly well, whilst other blocks were poor and backward, mainly owing to faulty preparation of the land. Crops are said to have suffered badly from smut during the past season. Like the rest of the State Pinnaroo has not been favoured with good winter rains during the present year. We append rainfall for the year as registered at Wow Wow:—

1902—January	.38
February	.44
March	.90
April	.09
May	.82
June	1.80
July	.78

We are afraid that farmers will be somewhat disappointed with Agricultural College crops when they visit that institution this month. The season has gone dead against them, and their appearance is such as to have turned Professor Lowrie's hair grey had he still been with us; and they are certainly not calculated to impress his successor with the capabilities of the land. Professor Towar is in the position of the observer, as actually all the seed was under ground before his arrival. Prior to his departure Professor Lowrie was requested to outline the plans he had in view for the approaching season. To these plans Professor Perkins adhered as much as possible. Land was broken up after a heavy fall of rain in March, and seeded with oats in April. The oats were fully two months in showing above ground, and are now more or less of a dismal failure. This is the paddock that secured exactly similar treatment two years ago, and with a favourable season yielded such splendid results. The wheats in early fallow are looking well in places; in others are exceedingly poor. A patch of ground fallowed in October is bearing a miserable crop. As in most other places the late sown crops are far and away the best, although frequently placed in the worst class of land. The mistake made was in sowing too early, and the only consolation that can be gathered from the fact is that in nine years out of ten, it would not have proved a mistake.

Professor Towar and Mr. Quinn attended the Conference of Southern Bureaux held at Port Elliot on August 14, the report of which appears elsewhere. Mr. Quinn has also given pruning demonstrations at Forest Range and Woodside during the month, and has conducted the annual examination in pruning of fruit trees at Roseworthy College.

Mr. Summers, the Inspector of Fertilisers, paid a visit to Willunga to attend a meeting of the local Bureau, held at the farm of Mr. T. Pengilly, who is carrying out experiments for the department in the manuring of pasture land, as well as tests with various wheats. Full reports of these experiments will be published later, and it is sufficient for the present to say that the result of the direct application of manure to grass so impressed the visitors that several of them made up their minds to undertake similar experiments for themselves next year.

We notice from the daily press that Victoria is up in arms against the fowl tick, and contemplates shutting out South Australian fowls from her borders. This policy savours too much of shutting the door when the bird has flown. We do not deny the presence of the tick within our territory, but we suspect that our neighbours are just as badly off as we are. We have it on reliable authority that the well-known breeder, Mr. A. J. Murray, of Mount Crawford, traces the presence of tick in his yards to some prize Cochins he imported from Melbourne over ten years ago. In any case the Minister (Hon. R. Butler, M.P.) has written to the Victorian Department requesting that our exporters be not unnecessarily penalized.

Between July 26 and August 26, 2,221 cases of fruits have been exported under the departmental certificates. Of these only 820 cases, consisting chiefly of citrus fruits, were of local production, the remainder being re-exports. 56 packages of plants have been certified for export. 6,189 cases of fruit have been imported. Of these 3,485 cases were bananas from Queensland, and 2,535 cases of apples from Tasmania. 48 parcels of plants arived from outside sources, 26 coming by parcels post, and 22 by sea at Port Adelaide. Among these two parcels contained rooted grape vines. In consequence of this the whole of the parcels were immediately burnt and the consignees warned of the risks they run. The other parcels consisted chiefly of roses. The apples from Tasmania have been carefully inspected. No codlin moth larvae are now found, but Mussel scale is more or less prevalent in the consignments. 1,486 packages of vegetables were certified for export during the above period. In the country districts no inspectors are at work, excepting in Stanley, where a few days have been devoted by the Inspector to visiting orchards, and homestead blocks, with a view to instructing the occupiers in the winter work in connection with the suppression of codlin moth.

The Minister of Agriculture has approved of the formation of a branch of the Agricultural Bureau at Whyte Yarcowie, with the following gentlemen as Jno. McLeod, G. Mudge, Jos. Hunt, Thos. Faul, D. Dowd, and G. H. G. Boerke.

The Produce Export Department is now prepared to treat lambs for export on behalf of shippers. The charges will be 0.35d. per lb. for slaughtering, weighing, grading, freezing, and branding, but if desired the department will undertake the whole of the business on behalf of shippers, including freight and insurance and selling in London or elsewhere, charging only the actual cost for doing this work. Farmers and graziers should write the department for a circular giving full particulars, and arrangements could then be made for forwarding their stock to the Dry Creek Slaughter Yards. The department undertook the sale of 3,640 lambs last year, and, although the lambs only averaged 32½ lb. each, a net return of 9/9½, including skins and fat, was made to the shippers. The average gross price realized in London was 4.10d. a lb. The total charges on these lambs, covering all expenses from the time they were received alive until the account sales from London were returned to shippers, only amounted to 1.28d. per lb.—probably the lowest rate yet offered throughout the Commonwealth.

ROSEWORTHY AGRICULTURAL COLLEGE NOTES.

FARM.

Through the kindness of Mr. S. S. Ralli, of Werocata, in presenting us with a Shropshire ram last year, we have been enabled to compare some of the progeny of this ram with that of the Dorset-horn this year.

Both the Dorset-horn and the Shropshire were put to Dorset-horn x Merino ewes. The lambing took place during May. The Dorset-horn being a little earlier than the Shropshire.

The following show the results of the experiments up to the present time:—

Weights taken July 28—

20 Dorset-horn cross averaged 63¼ lb.
10 Shropshire cross averaged 64¾ lb.

The weight of the heaviest Dorset lamb was 82 lb., whilst that of the Shropshire was 76 lb.

Weights taken August 23—

20 Dorset-horn cross averaged 80 lb.
10 Shropshire cross averaged 86 lb.

The heaviest Dorset weighing 100 lb., whilst the heaviest Shropshire weighed 94 lb.

The reason for taking the average of 20 Dorset-horn to 10 Shropshire lambs was because there were twice as many Dorset lambs to choose from. Professor Towar has decided to show five of each cross for fat lambs, other than Merino, and 10 Dorset-horn cross for Elder, Smith, & Co.'s prize for freezing and shipping lambs at the forthcoming show. The lambs are to be sold by auction on the show ground.

The second and third year students have been aiding in the conduct of the above experiment, and will be present and assist in making selections for the Adelaide Show.

EXPERIMENTAL VINEYARD.

By H. E. Laffer, Superintendent of Vineyard.

The continued dry weather during August has enabled the work in the vineyard to be pushed on, thereby making up somewhat the time lost in May and June. First ploughing has all been completed, and a good start made on the second ploughing. Though this operation is later than usual, the vineyard is looking fairly clean owing to dry weather that has kept weeds in check. All minor operations, such as digging, hoeing, &c., have been practically finished, while pruning of the fruit trees is also completed.

Vines in many places show signs of bursting. Almond trees have finished flowering, being about three weeks later than last year.

Many of the peach trees show traces of Black Aphis, and are being sprayed with kerosine emulsion.

Sulphate of ammonia is being applied now to vines where necessary; the manure being spread in the first furrow thrown back against the row.

The weather during August has been very trying to all vegetation. Clear warm days with winds varying from north-east, and at the same time clear, frosty nights, have kept everything back. Very little rain has fallen, only .56 of an inch being recorded up to date. The total fall for the year so far has been 6.73 inches. This means that September must be very wet to bring the fall anywhere near the average. The lowest minimum temperature for the month was 29 degrees F., and the highest sun temperature 128 deg. F.

PHOSPHATES.

By J. D. Towar, Professor of Agriculture.

Just now the wheatgrowers are entertaining fertilizer agents and studying prices and guarantees with a view of making selection of manures for next season's seeding.

The selection hinges on the relative prices, conditions of the purchase, payment, delivery of goods, the reputations the various phosphates have already acquired, and the reputation of the agents, rather than the special guarantee, since every agent in the market is offering a superphosphate under the guarantee of 36/38 per cent., water soluble, bone, or calcium phosphate. If 36/38 per cent. water soluble phosphates are ground to a uniform degree of fineness, there should be little or no choice among them.

I observe in the list of fertilizers some irregularities in the manner of expressing guarantee, and as it will be my duty, more or less, in the future to speak and write to farmers in answer to questions on fertilizers, I wish to appeal for a uniform system in the wording of fertilizer guarantees. I believe there is nothing intentionally misleading nor illegal in the methods practised by dealers at present, though I do take exception to the statement "Tric. Phos., water sol.," which is an abbreviation of tricalcic phosphate, water soluble, and is scientifically an impossibility. The fact being that tricalcic phosphate is soluble only in strong acids. This self-contradictory expression, however, is explained by the dealers to mean tricalcic phosphate, rendered water soluble. Properly speaking, however, as soon as the tricalcic is rendered water soluble its chemical form is so altered that it is no longer tricalcic, but monocalcic phosphate.

To be more explicit, I may explain as follows:—All phosphates are tricalcic in their natural state, and even when rendered water soluble or citric soluble, through the action of strong acids, their tendency is to go back to this natural state. The tricalcic phosphate may be expressed thus:—

$$\left.\begin{array}{l}\text{Calcium oxide}\\ \text{Calcium oxide}\\ \text{Calcium oxide}\end{array}\right\}\text{ Phosphoric acid,}$$

three parts of calcium oxide to one of phosphoric acid. Upon treating with strong sulphuric acid, two parts of the calcium oxide unite with the sulphuric acid to form calcium sulphate or gypsum, leaving one part of the calcium still in combination with the phosphoric acid. This remaining combination, termed the monocalcic phosphate is readily dissolved in water, and is very properly called "water soluble."

A portion of the original calcium usually escapes the complete action of the acid, a part of which remains in the proportion of two calcium oxides to one phosphoric acid, and another part remaining in the original form, giving rise to the term "insoluble" phosphate. The intermediate form, two calcium oxides to one phosphoric acid, is known as the dicalcic or reverted phosphate, and because the chemist finds it readily dissolved in citric acid, which is not so strong as sulphuric acid, it is termed "citric soluble."

This reverted or citric soluble phosphate is quite readily dissolved by the acids secreted by the roots of growing plants, and in soils sufficiently supplied with moisture it is considered almost as valuable as the water soluble phosphate. The water soluble and the citric soluble are often classed together under the name "available." The "acid soluble," or tricalcic phosphate proper, is but slowly affected by the natural agencies in the soil. One should not expect large immediate returns from applications of the "acid soluble" phosphates, but their influence should be felt for a good number of years.

For my part, since all of our fertilizing phosphates are in combination with calcium, I prefer to eliminate entirely the terms "bone" and "calcium" from the guarantees, and express the strength of the fertilizer in terms of simple phosphoric acid, giving the exact percentage of "water soluble," "citric soluble," and "acid soluble" respectively. There may be good reasons for retaining the calcium phosphate expression, and so long as we are juggling with the variety of expressions we may find the following factors convenient:—To convert bone or calcium phosphate to phosphoric acid multiply by the decimal .458, and to convert phosphoric acid to bone or calcium phosphate multiply by 2.183.

[We would point out that the terms "water soluble phosphate," "citrate soluble phosphate," and "acid soluble phosphate" have the sanction of law, and are all specially defined in the Fertilizers Act 1900.—Ed.]

SPREADING MANURE ON PASTURE LANDS.

A manure spreader that has given for years past the greatest satisfaction, and easily and cheaply made by any one, will no doubt be interesting to many of your readers. Most people have noticed what a "world" of droppings from cattle and horses accumulate about a homestead by the end of summer, and more especially where any artificial feeding is necessary. These droppings are in the meantime not only unsightly, but destroy the grass they lie upon. The idea of the device is to grind up to small particles, and spread evenly over the ground all these droppings, thereby enriching the grass, and giving the place a clean and tidy appearance. Four pieces of quartering 3 in. by 2 in., and, say, 16 ft. long, are laid parallel about 3 ft. apart. Across these are bolted, on the square, two heavier pieces, about 2 ft. from either end. A piece of wire netting is fastened to the back full width, and allowed to drag along the grass, held down by a batten fastened to the back edge. A horse is attached to drag this along, and each clod of manure is shifted and carried along by the drag, and all the time gradually being ground up and the small particles dropped among the grass. What the first quartering misses the second gets, and so on until the wire netting is reached, when, if of such a tough nature that it won't pound up, it either drops on to the netting or passes under it, in which case the driver—if very clean work is required—picks it up and throws it on the netting as the horse proceeds, and when a load is thus collected stops at some convenient spot and tips it all off in a heap for burning or carting away. A boy can thus clean up and greatly benefit a large area in a day, as he includes a sweep of 16 ft. each turn, and only a matter of calculation to find out what can be accomplished at a minimum of expense. It is very necessary that it all be made on the square, so that when necessary to pass through a gate, by hitching the horse to one corner only, the device will close up like scissors, and thus easily go through a very narrow space. Any one who tries it will never be without it again. A couple of bullock chains stretched between the quarterings and loose enough to drag on grass are a great help in the breaking up process.—Pastoralists' Review.

Salt for Sheep.—The value of salt for sheep is shown by an experiment in France, where three lots of animals were fed on hay, straw, potatoes, and beans for 124 days. One lot had no salt, one had ½ oz. of salt each every day, and the other had ¾ oz. Those that had ½ oz. gained 4½ ℔. more than those which had no salt, and 1¼ ℔. more than those which had more than ½ oz. The salted sheep clipped 1¾ ℔. more of wool and a better fleece than those that had no salt, showing better results in the wool.

HAY OR STRAW BAILING PRESSES.

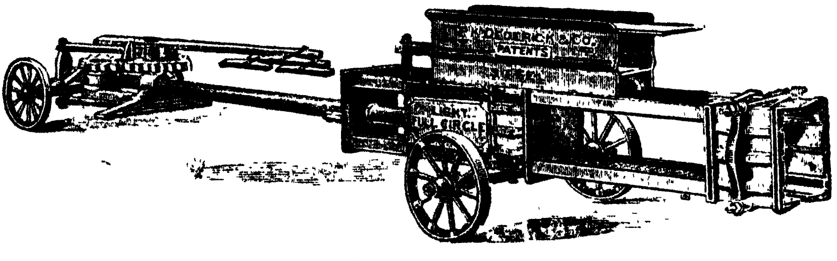
By Arthur J. Perkins, Secretary for Agriculture.

About three years ago one of "Ladd's Patent Continuous Baling Presses," made by Messrs. J. & F. Howard, Bedford, England, was imported for the use of the Agricultural College; and last summer the late editor was somewhat unfortunate in his requests that I should write a short article on this implement, which he thought might prove of interest to readers of the Journal. Unfortunately at the time my hands and thoughts were full with the unusual strain of harvesting operations, and I was obliged to deny myself the pleasure of complying with Mr. Molineux's entreaties. In contemplation of a future article various photographs were at the time taken by Mr. Quinn, of this department, and others; these I am now able to reproduce with a few notes, which I hope will not be without their interest.

Continuous Baling Presses are comparatively modern implements, although as far back as 1816, General Morin, then a young artillery officer pointed out the advantages for military purposes of compressing hay by means of specially adapted hydraulic presses. Although he subsequently built several presses, that were largely used for military purposes he was not successful in devising a continuous press, that is to say the action of which was not intermittent, ceasing temporarily, whilst the bale was being removed. Moreover all his presses which worked somewhat on the principle of our wool presses, presented the objection of compressing the whole of the bale at one continuous stroke, with the result that when opened out the hay came away very irregularly, and was in consequence awkward to handle.

An improvement on these presses was devised in the United States, the box into which the hay was pressed was done away with, and the latter given a rotary movement, whilst being compressed by a flat piston. This implement was hand driven, and formed cylindrical bales, that were more awkward to load than rectangular ones; moreover the action was still intermittent, work ceasing whilst the bale was being removed.

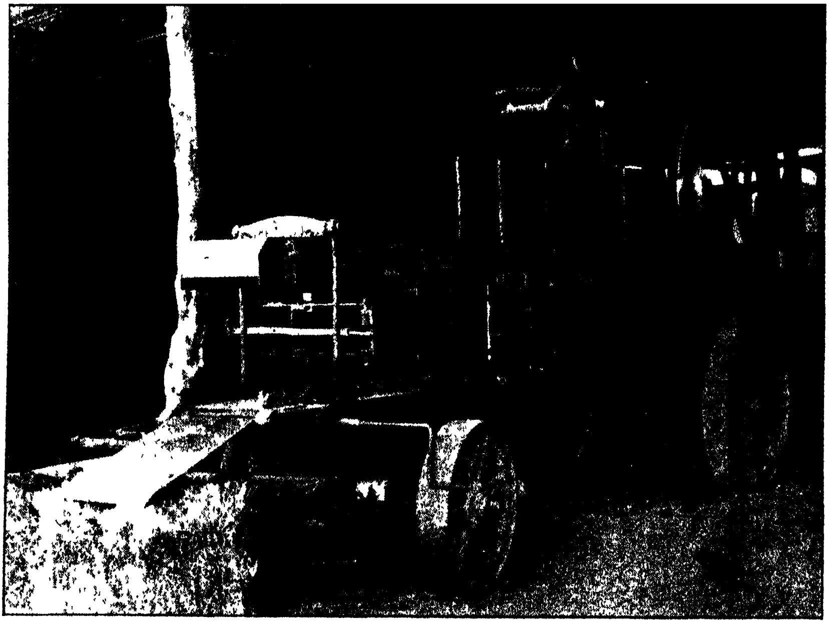
The first continuous presses, in which the hay entered at one side, and issued at another in the form of bales without interruption, appear to have originated also in the United States. The Dederick press, of which we show an illustration, was one of the first implements of the kind put on the market. Subsequently their manufacture extended to other parts of the world, and they are now made extensively both in Europe and America; whether local manufacturers could not take them up as well, is a question that may perhaps receive an answer from the following notes.



Dederick Patent Baling Press.

In principle most of these presses differ little from one another. The hay or straw passes from a platform into an opening at the end of a hollow box, or rectangular section. Here a special head piece, placed above the opening, comes down and doubles the open sheaf in two; following on this, as the head piece rises a powerful piston presses the doubled sheaf forward in the box. A new sheaf comes along and is similarly treated; and thus the bale consists of a series of leaves receiving each a certain amount of individual pressure, which, when the bale is opened out enables them to come off readily in fairly regular layers. The hay or straw transmits the pressure it receives very badly, and this fact in conjunction with the resistance of friction offered by the sides of the box in which the piston works, enables the material to be considerably compressed, as under the influence of the strokes of the piston and the arrival of new sheaves it gradually works its way to the open end of the box Here it is removed in the form of rectangular bales.

The breadth and width of these bales is constant, being represented by the rectangular section of the box in which they are formed. In Ladd's Press, in use at Roseworthy, this section is represented by 18 inches x 24 inches. The length of the bale may be varied at the discretion of the man setting the automatic wiring apparatus in gear. The practice at Roseworthy was to make the hay bale about 2 feet long, and the straw bale about 3 feet in consequence of its lesser weight. The bale of straw averages about 90 lb., and the bale of hay from 112 lb. to 120 lb. Ladd's press binds the bales with two wires, encircling them at right angles to their length. This has been sometimes referred to as a defect—it is said that if one wire gives way, as may occasionally arise, the bale is liable to fall to pieces; three wires would give greater solidity. In practice we have not found the two wires to be a disadvantage. We use for the purpose No. 12 binding wire, one cwt. of which will bind from ten to eleven tons.



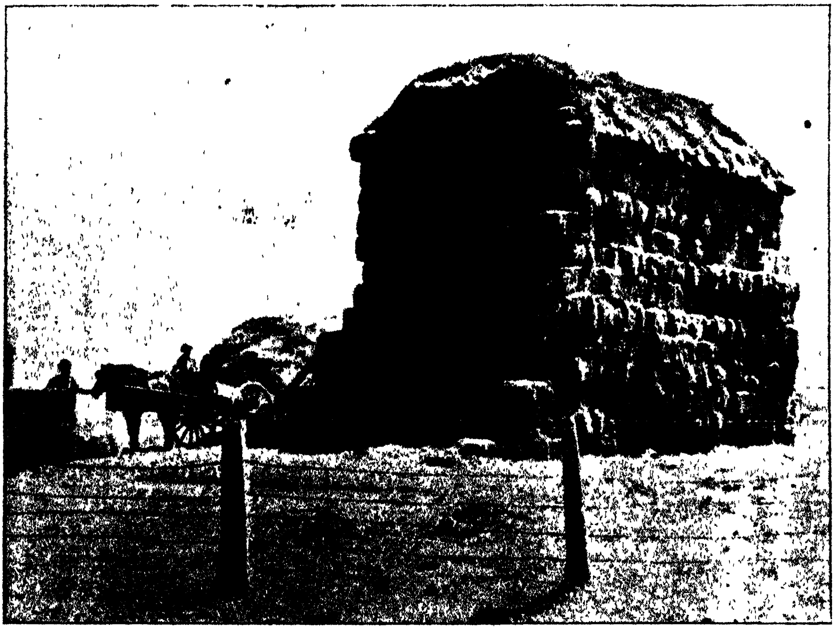
Ladd's Patent Continuous Baling Press.

The press at the College of which we give a picture, is driven by a 12 horse break power oil engine. It is found that the regular and continuous pressure of the oil engine is preferable to the occasionally erratic steam engine. Nevertheless the work to be done is perhaps just above the power of the engine in question, a more powerful engine would perhaps give more satisfactory results.

The personnel necessary for working the implement is somewhat large and generally distributed as follows:—two men attending to binding gear, one man feeding machine, two men on haystack, one man to remove and stack bales, and one to attend to engine. This personnel should under favourable conditions put through 350 bales of hay in eight hours.

The cost of the press working at the College was £180 in England; add to this about 35 per cent. for duty and carriage, we get £243, which represents its estimated value here. An oil engine of sufficient power to work it satisfactorily would cost about as much again, so that the complete outfit represents a capital of nearly £500. Of course the oil engine could be used for other purposes as well.

Now, the question arises as to whether these presses are likely to come into fairly extensive use in these States. Unquestionably the presence of a certain number of them here, and in Victoria, proved of some pecuniary advantage to us during the past two years; were it not for them we should have been unable to supply the requirements of the War Office in South Africa. But in these piping times of peace are they come to stay? Personally, I am inclined to answer the question in the affirmative; let us consider it in its various aspects.



Stack of Baled Straw at Roseworthy.

The original outlay—£500—perhaps shuts it out from the plant of the small farmer, and further during the course of a year it is hardly likely that he could find enough work for it, to cover interest and depreciation. But for the farmer of extensive holdings, who uses an engine for other purposes during the course of the year, or even for an association of smaller neighbouring farmers, who might own it jointly, is it likely in the future to prove of any use? The general practice here is not to feed long hay, but chaffed hay; probably this method reduces waste to a minimum, but whether it presents the bulky form of food necessary to the digestive organs of herbivorous animals in the best form possible, is to say the least of it an open question. The practice has I believe been frequently condemned by veterinarians of merit. Feeding with chaff, however, is likely to continue the general practice, owing to its simplicity and perhaps owing to reduction of waste. It may be pointed out, however, to those who are purchasers of chaff, that it leaves a tempting door open to those who do not mind stooping to fraudulent practices.

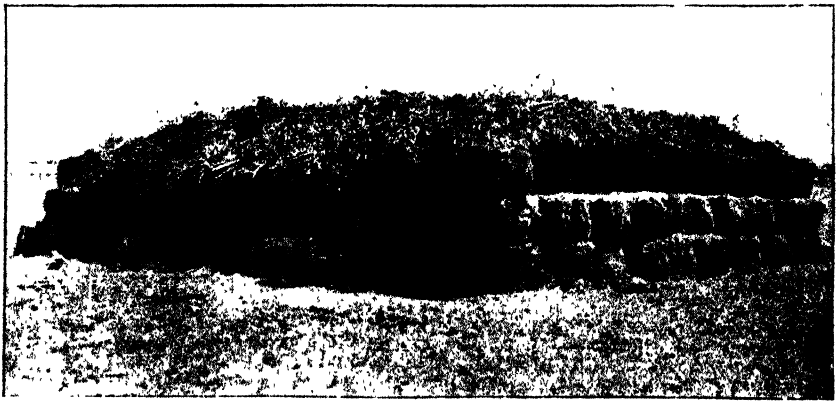
It is certainly unnecessary at the present moment to point out that the country we call our own is pre-eminently one of uncertain rainfall; fodder may be abundant in one locality, and totally deficient in another. In the circumstances, any method tending to reduce the cost of transport must prove a boon. One ton of chaff occupies about 160 cubic feet, whilst pressed hay according to the degree of compression will occupy from 115 to 120 feet, so that roughly speaking the ratio between the two is as 3 is to 4. For shipping parcels this must of course prove a distinct advantage, nor can this advantage be overlooked when carriage is effected by teams or on the railways. The following figures show what within recent years have been our shipments to neighbouring states:

1888..	18,155 tons of hay and chaff.
1889..	23,020 tons.
1890..	5.977 tons.
1891..	6.514 tons.
1892.	6.102 tons.
1893	5.458 tons.
1894..	14,142 tons.
1895..	37,117 tons.
1896..	33,205 tons.
1897..	4.178 tons.
1898..	8.916 tons.
1899	10,695 tons.
1900..	9.185 tons.

These figures show that circumstances occasionally arise when a considerable business in hay can be done with the neighbouring States; but even in years of moderate exports such as prevailed from 1897 to 1900, taken in conjunction with local requirements, the volume of business is such as to justify the more general use of presses.

There is another aspect of the question, that has not yet been considered; it costs far less to press and bale hay than to chaff it. A large chaffcutter, with self bagging gear, will cost about £100, and require a motor of at least equal power to that necessary for working the press. True, as chaff is generally fed to farm horses, the chaffcutter will serve to supply home requirements. Such a chaffcutter will not cut more on an average than 14 tons in eight hours, and absorb the labour of 8 men, as against 17 to 18 tons of the press, worked by 7 men.

It is however, not for hay alone that these presses are likely to prove of use on a farm. In fact the College press was imported principally to press straw. Anybody who has had any experience with a threshing machine will know how difficult it is to get the straw out of the way. When the crop is threshed, and not stripped, as is the case in the South-East, the presses will prove a source of considerable economy. One of our illustrations shows Ladd's press working in conjunction with a threshing machine at Roseworthy. It will of course be pointed out that the great majority of our crops are stripped, and the straw left to go to waste as a thing of no value. It is questionable whether such a practice will continue many years longer, particularly in our

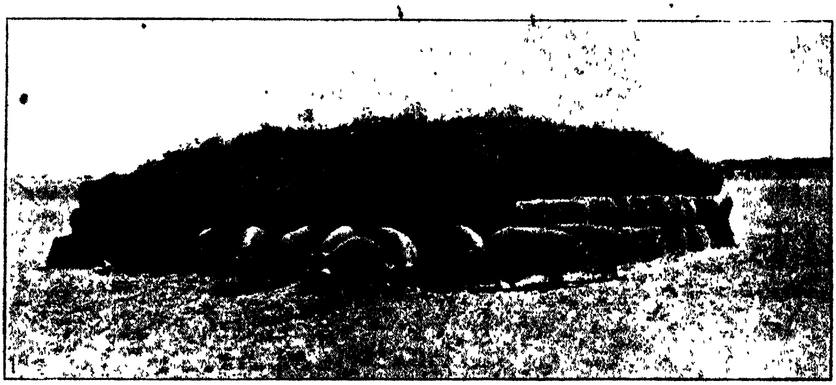


SHELTER BUILT IN FIELD—STRAW BALES FOR SIDES ; ROOF IS OF MALLEE BRUSH.

The Press Baling the Straw as it comes from the Thresher—Roseworthy College Farm.

districts of average rainfall. Some already use a header, and here the press might well render service. It is an error to suppose that straw is fit only for bedding; that it is the equal of hay could not of course for a minute be maintained, but whether it cannot be more profitably fed as bulk food in conjunction with some more concentrated form of food such as barley, or oats, as is the case in other countries, is certainly worthy of passing consideration. It cannot be said to be used to advantage by turning a few head of stock into the paddock that tread down ten times more than they eat, or by setting a match to it prior to fallowing.

It may also be pointed out that these bales of straw can be put to various uses, some of which are shown in our illustrations. The bales are of convenient shape and size to build rapidly rough shelters in out paddocks for pigs or even horses. When necessary they can be removed to another part of the farm without much inconvenience or expense. It is even said that occasionally in America, temporary dwelling places are built out of these bales; this is evidently a case of bricks without clay.



Shelter Built in Field for Pigs.

I do not pretend that these presses are within the reach of everybody's purse; but, I believe that they might with advantage to the State come more into general use than is at present the case.

Kansas Barn Built of Baled Straw.

FARM HINTS FOR SEPTEMBER.

By A. Molineux.

In the early districts the crops that are backward through absence of sufficient rain may possibly benefit from a light top-dressing with sulphate of ammonia, or nitrate of soda. In other and later localities, a light harrowing and top-dressing will most probably help the growth. Some superphosphate will be useful for top-dressing. If this is rather sticky, mix bonedust with it.

Sugar beets should be drilled on a few acres of the land laid up in fallow. This practice has been recommended by myself for the past twenty years. Farmers in Gippsland have just discovered the great value of sugar beets as food for cows especially, and for live stock generally. Four pounds of seed is enough for an acre drilled two feet apart, (or 30 inches on poor land), and thinned to 12 or 16 inches. Single the plants when large enough, and hoe frequently Enrich the soil for beets to be used for feeding purposes.

Mangolds are of exactly the same nature as sugar beets, and require the same treatment; but being larger require more room. For shallow soils the Globe and Tankard varieties are best. Small roots are richer than those of large size.

Broom corn, if properly grown, ought to be a profitable crop. The "broom" brings a good price, the seed is valuable and plentiful, and the leaves and stalks serve to feed the live stock. Plants should be in rows three feet apart, one foot apart in the rows, and seed drilled one inch deep. Three pounds of seed is ample for an acre. It is important to get true seed, such as was grown by the Industrial School for the Blind, Brougham place, North Adelaide, last season. When the young plants are four inches high use the hoe to open the soil and kill weeds, and hoe frequently afterwards. The "broom" should be cut when the seed begins to harden, and must be hung or laid flat on wire-net hurdles in a shady place until dry. Seed should be raked off with a "comb" made by driving a lot of wire nails on a board.

It is a great mistake to bury seeds too deeply. Have the soil broken deeply and well pulverized. Two inches is almost too deep for maize, melons, pumpkins, and similar large seeds, and one inch is deep enough for smaller seeds. It is desirable to press the soil upon the seeds after sowing, to bring both into contact, and to harrow or hoe when the plants are up. Two inches depth is enough when hoeing (cultivating) any crop, and this work should be continued at close intervals as long as the size of the plants will permit.

Exposure to great heat and strong light is not conducive to the conservation of organic matter in the soil; and, if the surface is caked or solid, there must be considerable escape of moisture. The nitrifying agencies in the soil cannot act unless there is a moderate quantity of moisture and neither too high nor too low a temperature. For these reasons it appears to be reasonable to presume that the growing of green crops for summer and autumn should help to maintain the proper degree of warmth and humidity in the soil. Of course, such crops can only be grown by the aid of the drill and the frequent use of the hoe—it is nonsensical to attempt to sow broadcast and leave the rest to nature.

Sow lucerne with drill on land already well prepared. Bury half an inch to one inch deep, and roll at once. When the plants appear, harrow lightly. Ten pounds of seed is enough, if drilled, for an acre.

Kohlrabi and Swedes should be sown in drills two feet apart, one inch deep, then rolled. Hoe when the plants are up, and thin out to a foot apart. Three to four pounds of seed is ample for an acre. Enrich the land and cultivate often.

Try an acre or more of Dwarf Essex rape, on well prepared and enriched land. Three pounds of seed is enough for an acre, drilled at 30 inches apart and a foot in the rows. The Planet implements are best for sowing and cultivating all summer crops. Mustard is another crop requiring similar treatment, but ten to twelve pounds of seed are wanted for an acre. Mustard seed is saleable in Adelaide, and the crop is ready in ten or twelve weeks after sowing.

The following are some of the crops useful for fodder which should be sown during this month:—Maize, Holcus, Dhurra (Kaffir Corn), Sorghum (many varieties), all kinds of millets, Melilotus varieties ("Bokhara clover," &c.) Buckwheat, Chicory, Couch grass, Pumpkins, Cow melons, Pie melons, &c. Beets and Mangolds, Kohlrabi, Swedes, Phillip's grass (Sorghum Halapense, properly "Aleppo grass"), all kinds of Poa grasses, Lucerne, Pearl millet, Sunflowers, Tagosaste or Tree lucerne, Potatoes.

Sow pumpkin seeds in patches twelve feet apart, twelve seeds in each patch, and reduce to three plants if more come up. Sow some maize broadcast between the patches, to keep the runners from being shifted by the wind.

In America there are very few farms without silos, and even in Victoria there are not a few of these valuable structures. South Australia was the first in this part of the world to start making ensilage—and is now behind all the other States in following the pioneer exemplar. Ensilage is more wanted here, and would be of far greater benefit to all who adopt it, than anywhere else—why do we neglect it so persistently? If ensilage would make itself, every farm would be well supplied with fodder!

In the hilly districts and South-east, sow white clover and other varieties, trefoils, cocksfoot grass, Yorkshire fog grass, rye grasses, fescues, poas, Medicago varieties, and Brome grasses.

Prepare everything for hay harvest. The site for the stacks should not be in an awkward corner, nor where the water flows by natural gravitation to a centre. The string binders, mowers, and other implements should be examined and proved to be in perfect order, hay frame and wagons must be fit for use.

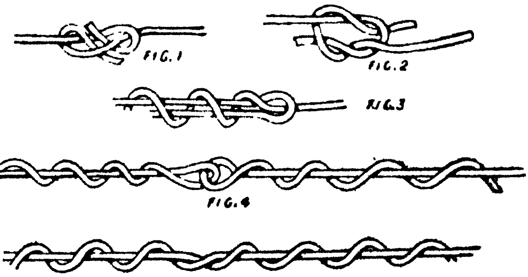
What will you do to protect the crops against destruction by grass fires?

SPLICING AND COILING WIRE.

There are numerous methods of splicing wire for fencing purposes, and every man has his particular choice. I give here below figures of what I consider four of the best kinds of splice.

Fig. 1 represents the "knot splice" now almost universally used. It is far better adapted to wire that is not pliable, and somewhat brittle, than any other.

Fig. 2 also represents a "knot splice," but not so good as Fig. 1



Splicing Wire.

Fig. 3 is the "loop and twist" splice, often used, but not so good as the preceding splice.

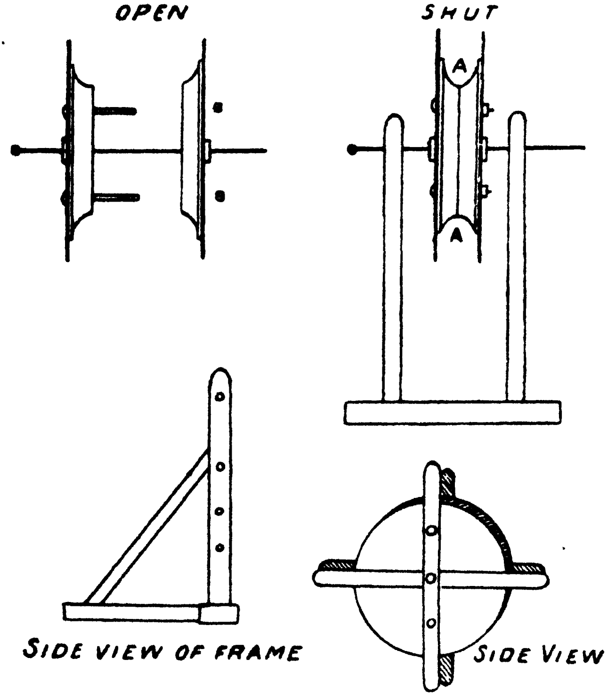
Fig. 4—The "Loop" Splice.—This splice is objected to principally on account of its liability to break under sudden pressure, and the fact of one wire being liable to cut the other.

Fig. 5—The "Telegraph" Splice.—This is the oldest of all splices, and one that can only be recommended where new wire is used, as the short turns necessary to make it generally cause the wire to break, sometimes when one-half the splice has been completed.

The "knot" splice is, to my mind, the best of them all. In the first place, is far easier to do, and, when done, it is the most secure, and quite as neat.

Splicing is a thing that should always be properly and carefully done. I have seen wires break as often as five or six times at the same splice during the process of straining. This, however, has been during cold, frosty weather, when it is advisable to carry a tin of hot coals to warm the wire before commencing operations. A tin such as used by the tinsmiths will answer the purpose admirably, and save a great deal of unnecessary labour and loss of time.

The following sketch shows a good and cheap method for coiling wire from fencing that is required to be removed. The features of this method are that any handy man can make one, and it coils the wire neatly and just as tight as when it comes from the manufacturer. The spool is cut from a solid gum spar, say 18 to 20 inches thick, then hollowed out in the centre, and bored for the axle, then cut in halves, as shown at A, and the hardwood battens are then secured to this by two 5-8 inch bolts to spool; when the spool is full with wire the two bolts are loosened and the spool forced apart, and the coil of wire is tied before removing.—Crossbred, in Pastoralists' Review.



Coiling Wire.

Ants on Fruit-Trees.—There are many remedies for preventing ants from attacking fruit-trees. A good one is to take an ounce of arsenic, place it in an old iron pot with a quart of water, and boil gently until it is reduced to about a pint; to this liquid add ½ lb. of sugar, which will form a syrup. Place a little of this in saucers in the run, around the trees, and in the haunts of the insects. Care of course must be taken that children, fowls, &c., do not get to the poison. A little London purple dusted round the tree and about the nests will also be effective. Ants can easily be destroyed by attacking them in their nests. Take a sharp-pointed stick and make a hole in the ant-hill about 6 in. or 8 in. in depth; into this pour about two tablespoonfuls of bisulphide of carbon, and then press the soil together at the surface to close the hole. The fumes of the liquid will penetrate the soil and kill the ants.

SIMPLE HOME REMEDIES.

The hints and suggestions given herewith are expressed with rather more confidence than we should generally use in regard to the efficacy of such remedies. They are, however, very simple, and for emergencies can do no harm.

Salt and water, used as a gargle for sore throat is equal to chlorate of potash, and is entirely safe. It may be used as often as desired, and if a little is swallowed each time, it will have a beneficial effect on the throat by cleansing it and allaying the irritation. In doses of one to four teaspoonfuls in half a pint to a pint of tepid water, it acts promptly as an emetic, and in cases of poisoning is always on hand. It is an excellent remedy for bites and stings of insects. It is a good astringent in haemorrhages, particularly for bleeding after the extracting of teeth.

Mustard is another valuable remedy. No family should be without it. Two or three teaspoonfuls of ground mustard stirred into half a pint of water acts very promptly as an emetic, and is mild and easier to take than salt and water. Equal parts of ground mustard and flour or meal made into a paste with warm water, and spread on a thin piece of muslin, with another piece of muslin laid over it, forms the indispensable mustard plaster. It is almost a specific for colic, when applied for a few minutes over the "pit of the stomach" For all internal pains and congestions there is no remedy of such general utility. It acts as a counter-irritant by drawing the blood to the surface; hence in severe cases of croup a small mustard plaster should be applied to the back of the child's neck. The same treatment will relieve almost any case of headache. A mustard plaster should be moved about over the spot to be acted upon, for if left in one place it is liable to blister. A mustard plaster acts as well when at a distance from the affected part. An excellent substitute for mustard plasters is what is known as "mustard leaves." They are perfectly dry, and will keep for a long time. For use it is only necessary to dip one in a dish of water for a minute and then apply it.

Common baking soda is the best of all remedies in cases of scalds and burns. It may be used on the surface of the burned place either dry of wet. When applied promptly, the sense of relief is magical. It seems to withdraw the heat, and with it the pain, and the healing process soon commences.

Whenever you contract a cold, before resorting to drugs of any kind, try the following process:—If able, go out into the open air, and breathe copiously and deeply and slowly for about twenty times, repeating the operation every hour until cured. If unable to go out, have the windows and doors open, wrap yourself in blankets or other warm clothing, during which time do as just directed. Some persons having had a cough for six weeks have got rid of it by this process; also cured themselves of colds newly contracted Therefore, everywhere try to cultivate full and frequent lung inflation by breathing clear out, clear in, and low down—that is to make all your breathing as when taking a long breath; and this will have a tendency to throw off the waste materials at the pores, and revitalise the blood, and thereby impart warmth and energy to the system. See that the rooms are well ventilated, especially your sleeping apartment. Wear woollen stockings and strong boots.—Faulding's Medical Journal.

THE RUSSIAN THISTLE.

Some few years back startling news was published throughout the world about the spread in Northern America of a weed commonly called Russian thistle, from the fact that it was supposed to have been introduced in seed wheat imported from Russia. Scores of official bulletins were issued in America dealing with the marvellous rapidity of the spread of the weed, the serious injury it was doing and the necessity for drastic action to prevent the ruin of the farmers in the infested districts. These bulletins contained illustrations and descriptions of the plant, and Australian enquirers at once recognised it as a close relative to the indigenous bush Salso kali, commonly known in our Northern districts as "buckbush;" the virtues of which as a fodder for stock used to be so eloquently dwelt on by our old friend Mr. Jno. Miller, of

Merriton. Quite recently a member of the Agricultural Bureau took Mr. A. Molineux to task for saying the Russian thistle and the South Australian buckbush were nearly identical in their characteristics, and in doing so he called attention to the serious accounts received from America concerning the former weed. It is worthy of note that although the spread of the weed was never seriously checked in America we have heard very little about it of late. The Nebraska Farmer of June 12, publishes the following astonishing report concerning the plant:—"It has only been a few years since the State Legislature of Nebraska passed a law compelling road overseers and land owners to do a certain amount of work in trying to destroy the weed known as the Russian thistle, which at that time threatened to destroy the crops, peace, and prosperity of our land. Newspapers throughout the State published long legal notices concerning the law which was enacted against this terrible foe. Farmers worked hard and long in the broiling sun, ploughing, harrowing, hoeing, raking, and burning, hoping to rid their land of this detestable weed, but the more they legislated, the more they printed, the more they worked, the faster and thicker the weeds grew, and their efforts were in vain. The old saying that 'there is no great gain without some small loss,' proved true in this case. The printers only barely got half pay for their printing and the farmers were out of pocket for their hard work, but in the Russian thistle they have gained a feed for cattle which cannot be surpassed by any other feed yet used in this section. Cattle will leave the rich buffalo grass in the spring to feed off the Russian thistle. As a crop producer it is only one less than alfalfa raised on bottom land. Last year some of our farmers harvested two crops of hay from the same land of Russian thistles. It cures quickly, is easily handled, and makes excellent summer or winter feed. Cattle do better on it than any other stock. It produces fat as quickly and easily as corn, and does away with the cornstalk disease which has killed hundreds of cattle in this country."

This quite exceeds any of Mr. Miller's claims on behalf of our buckbush, and should be reassuring to those of our farmers who fear the importation, with seeds and plants from America, of this terrible enemy. Certainly the value of the Russian thistle seems greatly exaggerated, but the newspaper referred to quotes the reports of several large farmers who have tried to utilise the plant, and these are emphatic as to its value. One farmer states that he will go over his old cornfield soil with a disc during the spring, that the thistle will spring up as thick as ordinary grass, and when eighteen inches high, and still green and tender, he will cut them with a mower for hay, allowing the plants to lie for only a short time before stacking. When the plants make fresh growth he will either turn his cattle into the field or will take off a second cut of hay.

A POULTRY MANUAL.

By D. F. Laurie.

[Four or five years ago the department issued a bulletin on "Poultry Breeding, prepared by Mr. D. F. Laurie. All these have been distributed, and in response to frequently expressed desires for a revised and enlarged edition, dealing also with diseases of poultry, Mr. Laurie has consented to prepare the same. The articles will be published first in the journal from month to month, and afterwards reprinted in pamphlet form.—Editor.]

Housings (continued).

For Ducks.

Houses for ducks need not be so elaborate, no perches are required for them. They do not suffer from the attacks of vermin to the extent that fowls do; the tick seldom attacks them, probably owing to their restless and nocturnal habits. In the country low sheds framed with rough timber and thatched with straw are suitable and cool particularly in summer. Ducks always seek shady cool places in hot weather. The straw should be renewed every year and the woodwork well tarred with gas tar. Failing this, strong kerosine emulsion will do. Fowls, ducks, geese, turkeys, &c., should never run together.

Ducklings are easily reared in long, low, cool sheds divided into compartments by boards about a foot or eighteen inches in height. Each compartment should be well floored with straw or wheat chaff, kept dry and clean.

Ducks need yarding at night owing to their habit of laying their eggs anywhere, even in the water. Shelter from the wind seems all they require, as, if at large, they seldom sleep in a shed.

FOR GEESE.

To be profitably bred geese require a large, well grassed run. These birds are seldom housed, and, like ducks, if at large, will feed about for the greater part of the night. During the breeding season the stock birds should be yarded, and accommodated with similar housing to that for the ducks.

TURKEYS

Turkeys require considerable range in well grassed country, with plenty of bush. They keep in the sheltered portions in rough or hot weather, and feed in the open when calm and cool. Whatever class of house is built for them, it must be large and carefully ventilated. It is better to let them sleep outside altogether than to house in insufficiently ventilated houses, as overcrowding and lack of ventilation are sure to cause disease. As a general rule these birds roost on fences, but where thieves and other predatory animals abound provision must be made for retaining possession of your birds. Unless there is plenty of suitable country at command turkey rearing cannot be recommended.

HATCHING HOUSES.

In the country, or where birds have a good run in a garden, the hens will often lay under bushes or hedges, and when they become broody may be given the sitting of eggs you wish to hatch. As a rule hens which "steal their nests," as laying away is often termed, bring off a large percentage of chickens, due doubtless to being undisturbed, and to the fact that the nests are on the ground, which is the proper place for them. The fact that remarkable hatches frequently resulted from nests made in dry spots above the ground does not in any way affect the rule that all nests should be on the ground. The reason for selecting this position is that there is less evaporation of the aqueous contents of the egg during incubation; the warmth of the hen's body attracting the moisture from the ground even when apparently dry. When only one hen has to be confined a small iron poultry house made of two sheets of iron, or even a large box, will do if a small run is available. Each hen requires separate accommodation or there will be fighting and broken eggs. In Victoria several large breeders have elaborate hatching houses divided into numerous compartments from three to five feet square. There are two doors to each, one communicating with a passage way running the whole length of the hatching house; the other with a grassed run about 20 feet long. These houses would require to be made of iron to guard against vermin. Where many hens or turkeys are used for hatching a large shed with an earth floor may be used. Nests are hollowed out in the floor, in rows, at a convenient distance from each other, and covered with a light coop, or even a box, of sufficient size and provided with bars in front. For convenience each nest cover may be hinged to a long timber at the back of each row. Provide a large dustbath in the corner of shed, and let say seven or eight hens off the nest at a time each day. They can then feed and dust themselves. Should the hens become costive they may have a little soft food given them, and if loose, add some powdered chalk or charcoal to the soft food. Otherwise the sole food during incubation should be wheat. Do not feed when on the nest, but keep a supply of fresh clean water where the hen can reach it without leaving the eggs. The hens may have a number attached to them corresponding with coop number if the owner cannot readily identify them.

PORTABLE COOPS FOR CHICKENS.

Portable coops are highly desirable for chickens in confinement, as it enables one to provide fresh ground at frequent intervals. They should be as light as is consistent with strength and have an end sheltered. The sides may be about two feet high, and the top, in addition, covered with netting. If made too large they are cumbersome to move and do not answer on uneven ground.

Where possible give chicks full liberty, but accustom them to return to their own coop. This is done by feeding them there, after first confining them for say a week. When the hens, or turkeys, have charge of the brood they may be tethered in the garden and provided with a simple shelter against excessive heat or rain. When tethering attach a broad piece of leather to the hen's leg and fasten stout cord thereto; she will thus be kept from damaging plants, &c. Tethering the hen is far preferable to confining her in a small triangular coop, she can enjoy moderate liberty and see her chickens. When the chicks begin to scratch too much they can be removed from the garden.

The Utility Breeds of Poultry.

It is not intended to enter into a detailed description of the points of each breed; nor is it necessary to consider any breed which has not proved profitable either as an egg producer or as a table bird.

The fancier may become enamoured of a certain breed, and whether suitable or not for commercial poultry-keeping will recommend it to all and sundry, especially if he, as is often the case, has had no experience of other breeds. Practical breeders throughout America, Australia, and England, are unanimous in advocating the breeds hereafter mentioned, though individual authorities, as might be expected, exhibit a preference for certain of them.

FOWLS.

Dorkings are bred in four colours, two of which are fairly numerous in Australia, viz., the dark or coloured, and the silver grey. The White variety is occasionally seen but is apparently less suitable for our climate than the other two. The fourth is the cuckoo-coloured, considered by many to be the best. I have not seen any in this State. Mr. Harison Weir asserts that the old red is the genuine Dorking, of which a few are to be found in England. The hens are fair layers of nice sized white eggs. The cockerels and pullets rank in the very first class for the table. General characteristics—Large square bodies, short white legs, five claws on each foot, fine bone, white skin and flesh, which is rightly placed, and of the finest quality and flavour. Good specimens should be large, inferior, small birds are of no value. For the table, pure, or crossed with Old English, or Indian games, or Malay, the Dorking is pre-eminent.

Old English Game.—A breed small in appearance compared with Dorking, Wyandottes, &c., but carrying a surprising quantity of the finest meat, both in flavour and quality of any breed. Colours are various as in the long-legged Modern English game with which this valuable breed is not to be confounded. Then hens are splendid layers of fine, large, white eggs, and the chickens are hardy, and grow quickly. Although the chickens resulting from the cross between the Old English game and other breeds are a trifle smaller than when the Indian game or Malay is used, they are of better quality for table and the pullets are always excellent layers.

Indian Game.—Large, hardy birds, with fine breasts and wings, short in the leg. The hens are poor layers, and while the crossbreds resulting from the mating of this breed and others are splendid for the table, the laying of the pullets is often inferior. Chickens hardy, and quick growing. Should be large, long legs a great fault. As a table bird producer its chief merit is for crossing.

The Malay—various colours.—Very large bird, well developed breast, hardy except in cold climates. Hens poor layers. The Malay, as bred here chiefly for exhibition, is too long in the leg for table bird breeding. The fighting Malay, as bred in Mauritius and India, is short on the leg and better suited for table breeding. Very quarrelsome and much mortality and loss from fighting among chickens, and also the hens. Eggs tinted various shades of brown and white.

Langshans—Excellent all-round birds, the black, white, and blue, are now recognised. Of late, exhibition specimens in many cases show undue length of leg, which, if persisted in, will spoil the breed for table bird production. They have long, prominent breasts, flesh and skin white, and of good quality; the hens are good layers, especially in winter, of medium sized tinted eggs. The moderately short legged hens are good for crossing with Game and Malay for table birds. Chickens hardy, but not quick to mature.

Orpingtons—Black and buff.—A breed of compartively recent introduction; very valuable all-round layers and table birds; eggs more or less tinted, and of good size, and abundant in cold weather. Should be large, with prominent breasts, and very short on the leg. The buff variety, which owes its origin to other breeds than those from which the black variety was derived, needs further improvement for table purposes. Excellent for crossing with Old English or Indian game. Flesh and skin white and excellent in quality. Chickens hardy and quick growers.

Wyandottes—Medium sized birds in the following varieties:—Silver-laced, golden-laced, white, black, partridge, buff, &c. Square cobby bodies, short legs, small bone and little waste. Hens splendid layers, especially in cold weather, of fair sized eggs more or less tinted; chickens hardy and very quick to mature; pullets lay early. The favourite breed in United States and Canada for market and export. Unrivalled for general purposes, and for crossing with Old English and Indian game. Flesh and skin creamy white and of the finest flavour and quality.

Plymouth Rock.—Blue-barred and white; favourite breeds in America. Good bodied birds of moderate length of leg. Hens excellent layers of tinted eggs, chickens hardy, and fairly quick to mature. Flesh and skin from creamy white to yellow. Crossed with Old English or Indian game the progeny are good table birds.

Andalusians—Favouring the old Spanish in type, and blue in colour, which is difficult to breed. Fine layers of large white eggs; cockerels very precocious. Pure or crossed they are indifferent for table purposes. Should not be long on the legs. Combs large.

Leghorns, of which we have the white, brown, black, buff, and duckwing, are splendid layers, of fine white eggs. Moderately short legs, very large combs.

Minorca.—The black is usually bred, white are rare. Grand layers of large white eggs. The Minorca is the largest of the Mediterranean breeds, and for that purpose is generally preferred to Leghorns, which lay quite as well, but when crossed with farm flocks tend to reduction in size in progeny. Large bodies, legs moderate, combs large.

The last three breeds, and varieties thereof, are the principal laying breeds, and are somewhat similar in general outline, the large drooping combs of the hens and extra large erect combs of the cocks being prominent features. The chickens are hardy and quick growing, pullets lay early. For crossing for table they are, with the exception of extra large square Minorcas, of little merit. The Minorca-Langshan cross is a fair family table bird and a good layer.

The Hamburghs are all abundant layers, but the eggs are small with the exception of those of the black variety. Small size, moderate legs, handsome; chickens delicate when fledging; of no value, pure or crossed, for table. Colour of eggs, white.

Campines.—Belgian fowls of Hamburg origin. The Silver Campine, now fashionable in England, is of small size, but lays nice sized eggs in great abundance. Of no value, pure or crossed, for table.

The Ancona, a recently revived member of the Mediterranean breeds, similar in general outline to Leghorns, Andalusians, and Minorcas. It is a smaller bird, however, but lays heavily, the eggs are large and white in colour. Very small eaters, rather wild; chickens hardy and quick growers. No value, pure or crossed, for table.

DUCKS.

The Aylesbury is a large white-plumaged bird, skin and flesh white, fine layer. The best for the English market, but deteriorates in size if not bred with care. Matures quickly.

Cayuga.—A smaller bird, black; flesh of fine quality and flavour. Not bred to any extent.

Indian Runner.—A small, slim, long-necked breed, fawn and white; remarkable for its upright carriage and gait, which should be a run without sign of waddling as in other breeds. A splendid layer, rivalling many hens of noted breeds. Too small for table, but may be crossed to improve the laying of other breeds. Matures quickly.

Muscovy.—A very large breed of peculiar appearance. The ducklings when young are fair for table, but the flesh as a rule is not equal in flavour to that of other breeds named.

The Pekin.—Large white-plumaged birds with a distinct canary under colour; good layers, flesh creamy; ducklings hardy and quick growers. Generally conceded to be the most profitable breed to keep. The adults are very noisy.

The Rouen.—A large bird with very handsome plumage; moderate layers; flesh considered by epicures to be of superlative flavour. Owing to its dark plumage the ducklings must be killed before the pin feathers come, the presence of which would seriously detract from its appearance and market value.

For table the choice consists of Aylesbury, Pekin, and Rouen. The stock birds must be large, but the extra heavy specimens should be discarded. Judged from a high standard the medium-sized birds are preferable for breeding from.

The Common Duck. A bird of mean appearance and lacking any virtues as a commercial duck. Some strains lay very well. Unprofitable to breed.

GEESE.

The Toulouse is a large, grey and white bird, hardy and free breeder. The goslings grow rapidly, and if bred from good stock, will weigh 14 to 16 pounds before they are feathered. Highly recommended.

The Embden.—Large white bird, very scarce in Australia. In older countries it is held in equal estimation with the Toulouse.

Both these varieties must be large; stock birds 18 to 20 pounds at least.

The China Goose (brown and white varieties).—A small but very prolific breed, well suited for family uses; too small for export. Good layers and quick growers.

The Common Goose is the most useless and costly of all table poultry. As a rule its price is about five shillings, and when dressed weighs from six to eight pounds, which is less than a pair of prime ducklings eight weeks old weigh. This the average consumer is discarding, and he buys ducks instead. Quite unsuitable for the export market.

TURKEYS.

There are several English varieties, such as the Norfolk, Cambridge, Buff &c., which, as far as flesh goes, are very excellent. Degenerate specimens here are like the common turkey—too small to be worth breeding. The mammoth American Bronze turkey, a hardy bird of enormous size, has largely supplanted all other birds, and is without doubt the most suitable for our climate, as well as the most profitable to breed for either home or export market. Should be very large; extra heavy show specimens are not the best for stud purposes, for which medium birds are better, say hens not less than 16 or 18 lbs. and cocks 20 to 26 in ordinary fair condition, not fat.

GENERAL.

As regards fowls, ducks, geese, and turkeys it costs less to rear fine birds, bred from good pure breeds, or first crosses, the result of union of two pure breeds, than to rear mongrels. The laying breeds give a vastly higher value of eggs, and the table birds are fit for sale while the mongrels are growing bones and feathers.

During the many years the writer has been connected with the poultry industry his aim has been to induce general improvement of breeds by gradually discarding the unprofitable mongrel usually kept, and replacing with modern, utility breeds, such as herein described, which have been thoroughly proved. The writer has never counselled novices to take up poultry farming as a means of making a living or a fortune. There are many experienced men in these States whose sole occupation is commercial poultry breeding, and some make large incomes. The success of the venture, given suitable situation, breeds, and enough cash for a fair start, depends entirely on the individuals. Neglect of seeming trifles and lack of method can only end in disaster. Beginners should procure a limited number of birds of superior quality, discarding the inferoir culls from novice breeders' yards, and should study their birds intelligently. Profits will then result, and a steady expansion of the sphere of operations will be the order of the day. Above all things beware of keeping too many varieties. Be a specialist in one, if you are a stud breeder; and if you breed for market breed and sell only prime birds of level quality and condition. Many have a mania for crossing, but except for the specialist this is a great mistake. The ordinary commercial poultry keeper had best work to perfect the strains of breeds and crosses already tested and proved to be of value.

HORSEPOWER AS INDICATING WORK OF STEAM AND OIL ENGINES.

By W. R. Jamieson, B Sc., Lecturer on Physical Science
at the Roseworthy College

[From numerous enquiries made of us we are under the impression that farmers purchasing oil engines are apt to be misled as to working power by their familiarity with the more or less obsolete method of expressing the power of steam engines still popularly in use. We have therefore requested Mr. Jamieson to write us a short note on the subject. We hope it will be of interest to some of our readers.—Ed.]

By power is meant rate of doing work. Work is measured by the foot pound, this being the work done on 1 lb. when lifted through a height of 1 ft. The unit of power is the power of an agent doing work at the rate of 1 ft.-lb. per second. This unit is inconveniently small for measurements of power in the case of ordinary engines, and a multiple, namely, 550 units of power, or 33,000 ft.-lb. per minute, is the practical unit. This is the horsepower originally employed by Watt that his engines might be roughly compared with the source of power most generally used in his time. It is now, as above stated, a unit of suitable magnitude for the measurement of engine power, quite apart from any implication as to the number of horses required to furnish the same power. The horsepower of an engine is calculated by determining the work done by it (in foot pounds) per minute, and dividing by 33,000. There are two methods of measuring the rate at which a steam engine does work. By some form of dynamometer, the friction brake for example, in which the resistance is supplied entirely by friction, the actual (useful) work done by the engine in a given time is found experimentally. The power obtained in this way is termed brake horsepower (B.H.P.), and represents the useful power of which the engine is capable. On the other hand, the work done by the steam in the cylinder may be calculated after finding the mean pressure of the steam in the cylinder. The indicator (first used by Watts) gives an automatic registration of the varying pressure of the steam throughout the piston stroke. This varying pressure being known, the average pressure, or mean effective pressure of the steam in the cylinder is calculated. This pressure (or lb. per sq. in.) multiplied first by the cross sectional area of the cylinder (or sq. in.) and then by the piston speed (or ft. per min.—equal to the length of piston stroke in ft. multiplied by twice the number of revolutions per minute) gives the work done by the steam per minute. On dividing by 33,000 the indicated horsepower is obtained (I.H.P.). The number arrived at thus gives the rate at which work is done by the steam. Part of this work, however, is "lost," being consumed in running the engine and overcoming friction. The balance is "useful" work. It is seen therefore that the I.H.P. of a steam engine is greater than its B.H.P., because about 10 per cent. (in the case of a simple rate condensing engine) of the former is lost.

In the time of Watt the steam generated in the boiler had a pressure of a few pounds only above the atmospheric pressure. Watt proved, by the indicator, a mean effective pressure in his engines of 7 lb. per square in., and he used this number in calculating the horsepower of his engines; this he termed their nominal horsepower (n.h.p.). With the increased boiler pressures which distinguish steam engines of late days from those of the days of Watt, the mean effective pressure of the steam in the cylinder is much more than 7 lb., and their i.h.p. is, therefore, considerably in excess of their n.h.p. The specification of a steam engine as so many n.h.p.—by which is meant an engine of that h.p. in the time of Watt—has now no real significance, and is rapidly becoming obsolete. It is retained in a few cases only, notably in the case of engines for agricultural purposes. The horsepower of an oil engine is determined by a dynamometer, such as the friction brake and its power is specified as brake horsepower only. A farmer ordering an oil engine of say 20-h.p. would obtain an engine which would do useful work at the rate represented by this number; a steam engine doing work at this rate would be of 22-i.h.p. approximately, and this is the engine known to farmers as about 8-n.h.p.

WINE NOTES.

It was permissible to think that that much-discussed subject, "the adulteration of wines," had by this time died a natural death. We are surprised to see attention again drawn to it in the August issue of the Australian Vigneron and Fruitgrowers' Journal. This journal poses as a vinegrowers' organ, and we may presume is anxious to champion the best interests of the industry; in consequence its persistency in drawing attention to the alleged necessity for a Wine Adulteration Act in New South Wales passes our comprehension. According to the views of this journal, Victoria, with its extraordinary Act, and the rest of the Commonwealth with none, represent respectively the "Paradiso" and "Inferno" of the pious non-adulterating winemaker.

So far as we are concerned we are persuaded that the agitation that has been raised over this question is altogether out of proportion to the alleged delinquencies of winemakers or wine retailers, and constant harping upon the subject will, by poisoning the public mind, only injure the interests of the trade. It is not disputed that preserving substances such as salycilic acid have been occasionally used by makers in the past. In palliation of this it may be pointed out that at the time it was not generally known that these substances were likely to injure customers, and that in this State at all events it is a practice that has long been discontinued; and the Vigneron notwithstanding, we would fain believe that such is the case in New South Wales also. In any case it is extremely easy to proscribe the use of injurious preserving substances, without having recourse to the elaborate Victorian Act, which cannot but defeat its own ends. It is useless to penalise for delinquencies on which it will practically be impossible to obtain a conviction. In our opinion the Victorian Act is both harsh and unnecessary, and doomed to remain inoperative in many of its clauses. If a New South Wales Act is to be drawn up, we trust that it will not adhere to the lines laid down by the sister State.

The appointment of a special departmental chemist to analyse all wines has also the approval of the Vigneron. If this is really necessary the trade in New South Wales must really be in a bad way. That a State with only 8,000 odd acres of vines should require a special chemist to watch all wines put on the market is marvellous indeed. In the circumstances it is legitimate to infer that a butter chemist, a cheese chemist, a beer chemist, &c., are likewise necessary. Surely the clever Government Analyst, Mr. Guthrie, is well able to watch over the army of adulterators that appears to have invaded New South Wales.

On the 27th of last month, at the quarterly meeting of the South Australian Vinegrowers' Association, an attempt was made to ascertain the feeling of the meeting, with respect to the proposed sale of the London Depot to a private firm. After some discussion it was wisely agreed to postpone consideration of the matter, until a special meeting had been convened to consider this question. Unquestionably many arguments can be urged in favour of handing over the Depot to a private firm; but there is one insurmountable difficulty, which no amount of argument can remove. Given that an independent firm purchases the concern from the Government, there is no power on earth that can prevent it on the very morrow from transferring its interest for a consideration to one of the present local buyers. Winemakers would be perfectly willing to hand over the Depot to private enterprise, providing such a transaction would ensure the presence in the market of a new and independent buyer; but they are not willing to court the formation of a wine trust. We maintain that if the Depot is taken out of the hands of the Government, interests of winemakers will be made to suffer. We trust that the special meeting convened for the 17th of this month will see the wisdom of answering the proposal in the negative.

The cumbersomeness of the Federal Distillation Act was referred to at this meeting by Mr. Thos. Hardy, in very strong terms. He very justly pointed out that whilst many of the clauses might be necessary when applied to the grain or potato distiller, they were not only unnecessary, but burdensome to the wine distiller. A special committee was appointed to consider the matter, and it is to be hoped that they will be able to persuade the Federal authorities of the necessity of modifying their Act. We might mention here by the way that the new regulations concerning the manufacture of vinegar are also exceedingly harassing to the maker, and certainly require revisal.

IS THE USE OF ARSENICAL SPRAY DANGEROUS?

The question has been raised again here as to the possibility of danger from the use of arsenical sprays for the suppression of codlin moth, not only to man, but to stock eating green crops underneath the trees. This point has been repeatedly raised in Europe and America ever since compounds of copper and arsenic have been used in orchard work; and, fortunately, we have records of very careful experiments carried out in various parts to determine the question. It must be remembered that the copper compounds in Bordeaux mixture are very poisonous if taken in quantity, and the following extracts from "The Spraying of Plants," by Professor Lodeman, of Cornell University, bear on both points:—

"It is only when very late applications (of arsenic) are made, such as are utterly useless, that any of the poison is found upon the fruit when ripe, and then the quantities are so minute that they could in no way cause injury to the consumer. But even though all the poison sprayed upon the apples in making necessary treatments should remain there undisturbed a person would be obliged to eat at one meal eight or ten barrels (1,000 to 1,200 lb.) of the fruit in order to consume enough arsenic to cause any injury."

The following extract from Bulletin of U.S.A. Department of Agriculture, issued as a result of a scare raised in regard to the spraying of vines with Bordeaux mixture, is very clear:—"Accepting, then, 0.5 grain as the maximum amount of copper in any of the forms discussed that may with safety be daily absorbed, let us see how these figures compare with the quantity of this metal found in connection with properly sprayed fruits, as well as some other foods and drugs. Analyses to determine the amount of copper in sprayed grapes have been made in Germany, France, America, and elsewhere. The results of these analyses show that 'on this basis an adult may eat from 300 to 500 lb. of sprayed grapes per day without fear of ill-effects from the copper." It must also be remembered that fruit recently sprayed would not be eaten, as its appearance alone would prevent it.

Lodeman also quotes experiments by Professor Cook, of Michigan, on the possibility of stock consuming the grass under the trees being injured by the drippings from the trees. "In tree No. 1 a thick paper was placed under one-half of a rather small apple tree. The space covered was 6 ft. x 12 ft., or 72 square ft. The paper was left under until all drippings ceased. As the day was quite windy the dripping was rather excessive. In this case every particle of the poison that fell from the tree was caught on the paper. Dr. R. C. Kedzie analysed the poison, and found four-tenths of a grain of arsenic. Tree No. 2 was a large tree with very thick foliage. Underneath this tree was a thick carpet of clover, blue grass, and timothy just in bloom. The space covered by the tree was fully 16 ft. square, or equal to 256 square ft. As soon as all dripping had ceased the grass under the trees was all cut very gently and close to the ground. This was taken to the chemical laboratory, and analysed by Dr. R. C. Kedzie. There were found 2.2 grains of arsenic. Now, as our authorities say . . . . ten grains is a poisonous dose for a cow and 20 for a horse, there would seem to be small danger from pasturing our orchards during and immediately after spraying, especially as no animal would eat the sprayed grass exclusively. To test this fully I sprayed a large tree over some bright tender grass and clover. Then I cut the clover carefully close to the ground, and fed it all to my horse . . . . and the horse showed no signs of injury. The mixture was double the proper strength. . . . . This experiment was repeated with the same result. I next secured three sheep. These were kept till hungry, then put into a pen about a (sprayed) tree, under which was rich, juicy, June grass and clover. The sheep soon ate the grass, yet showed no sign of any injury. This experiment was repeated twice with the same result. . . . The analyses show that there is no danger; the experiments confirm the conclusion."

We have also local experience respecting the use of arsenic, showing that there need be no fear in utilizing the sprayed fruits. In 1897 Mr. Quinn sprayed a small block of apple trees at the Parkside Asylum orchard seven times with paris green of proved quality. Seventeen days after the last spraying two parcels of apples were taken from the trees with spray upon them. One sample was handled very carefully, so as not to remove anything from the surfaces of the fruits. The fruits of the other sample were wiped with a cloth. Mr. G. A. Goyder tested the samples, and reported, "Neither of the two samples of apples left by you on February 9 contained any appreciable quantity of arsenic." In connection with the Marion spraying tests during the following year, samples were carefully gathered four weeks after the last spraying. Trees sprayed seven times with paris green, which contained 43 per cent. of arsenic, and five times with arsenite of soda (Kedzie's formula) respectively were selected, only fruits showing the marks of the spraying very distinctly being taken Mr. Goyder reported on these as follows: "The parcels of apples received April 4, 1898, marked 1 and 2, yielded on analysis a very minute trace of arsenic. The quantity was so small that it could have no poisonous effect, even if apples of a similar quality were eaten exclusively for food."

CORRESPONDENCE.

[In this column we propose to answer questions of general interest, and also to make selections from our official correspondence. Questions dealing with matters of interest mainly to the writer will be answered direct. Correspondence invited. Ed.]

SUGAR BEETS FOR DAIRY COWS.

S. O. S.—Sugar beets are generally richer and more nutritious than mangolds. The practice of pulling the leaves prior to the complete maturity of the tuber cannot generally be recommended, as it can only be done at the expense of the latter. Fed to dairy cows in conjunction with nutritious dry food such as bran or chaff, sugar beets should give very satisfactory results. In any case they are richer than mangolds. Sow in drills 16 to 18 inches apart, and thin out. From 12 lb. to 18 lb. of seed per acre, according to the purpose for which the roots are grown, will be required.—(A. J. P).

BLACK SPOT ON GRAPE VINES.

J. F. - Pour half a gallon of commercial sulphuric acid on 50 lb. sulphate of iron (green copperas), then add ten gallons of boiling water, and stir until all the copperas has dissolved. Swab the spurs and crowns of diseased vine before the buds begin to swell. Do not make up more of the mixture than can be used in a day. If signs of disease appear in the summer, dust the shoots with equal parts slacked lime and flowers of sulphur.—(A. J. P).

GRAPES FOR EXPORT.

In the August issue certain varieties of grapes are recommended to be grown for the production of fruit for export. It was not, however, made clear, that this was in reply to an enquiry as to varieties that will stand the journey to Broken Hill, Melbourne, and Sydney. It was not intended to refer to grapes for export beyond Australia.—(A. J. P).

RINGING ZANTE CURRANT VINES.

C. S.—The implement for ringing zante currant vines can be obtained from Messrs. Harris, Scarfe, & Co., or Messrs. E. & W. Hackett. The price is about 7/6. The operation is usually performed just before the vines flower, the most suitable time has not, so far as I know, been settled by definite tests. —(A. J. P).

SPRAYING FOR CODLIN MOTH.

J. M. N.— I would recommend you to spray your trees with arsenite of soda, being very particular to use fresh lumpy lime, or you may burn the foliage. Give the first spraying after the blossoms have fallen, and when the young fruits are just formed. Repeat every fortnight until four or five dressings. It is unfortunate that growers should be hampered by the carelessness and neglect of their neighbours, but under present conditions the Department is unable to compel all growers to attend to their gardens.—(G. Q).

SPRAYING WITH BORDEAUX MIXTURE.

A. S.—Apricot and peach trees should be sprayed with Bordeaux mixture to prevent shothole and curl-leaf, when the flower buds begin to show colour. Many growers do not spray until a few blossoms are right out. It is important that the spray should penetrate beneath the budscales, which it cannot do until the buds have well started.—(G. Q.).

THE CODLIN MOTH.

SOME TASMANIAN EXPERIENCES.

By George Quinn, Horticultural Instructor

A few months ago I obtained the names of many well-known apple growers in Tasmania, and sent the following circular letter to each of them.

"This insect is the only pest which causes much trouble year after year to the orchardists of this State. If unchecked by unremitting attention, a few seasons after its introduction to an orchard, only a very small propoltion of the apples and pears remain unattacked. In the older orchard districts here the trees are large, and many have rough stems more or less studded with decaying knotholes, which afford much natural shelter for this pest. In such localities much opposition is shown by the growers to any legal interference. In the more newly planted districts the trees are planted and trained more systematically, and as a rule the growers show more eagerness to combat the pest, as they are desirous of keeping or exporting their fruits, and do not depend so much on the local markets as those in the older districts nearer to the City of Adelaide. I am desirous of knowing your experiences on this subject, and your opinion respecting legislative interference. I advocate here that large trees should be reduced in height, so that on ground suitable for transporting the apparatus they may be sprayed thoroughly and rapidly, or on steep hillsides the affected fruits may be gathered quickly and conveniently in conjunction with the bandaging system. Under our Act the distribution of the insect in any manner is prohibited. I enclose a copy of our regulations for the treatment of trees in orchards, and a pamphlet which is distributed amongst our growers. The arsenite of soda spray named therein has been applied here with considerable success by some of our growers. Four applications have been given, the first immediately after the petals fell, and the others at intervals of 12 to 14 days. By picking off the infected fruits and bandaging the stems, some of our growers have kept the pest fairly well under, but only when the trees have been kept low. I would like your opinion of the enclosed regulations, and the treatment recommended in the pamphlet. How do they compare with the methods found most successful in Tasmania, if any have proved successful and practicable?"

The replies received from those who kindly acknowledged it should prove of considerable interest to our growers at the present juncture:—

Dr. Benjafield, of Hobart, replied as follows:—"For years we were nearly giving up in despair; now we smile complacently on the whole business, and look upon the moth as an innocent creature, compared to Fusicladium and San Jose scale. The question of saving the fruit or not is now simply a question of care and industry and its reward, or negligence and loss. If your growers want to succeed let them submit to legislation and Government inspection by men who will do their duty. Without such legislation and inspection you will do but little good, as the orchards of careless occupiers will supply a whole district with moths. No trees should be allowed to exceed 10 ft. in height. All old, rough bark should be hard scraped. Probably in your long, dry, warm summer you get more than one brood: if so, you must redouble your energies, as your position is much worse than ours, and look after this bark as well as the bandages. Just here comes in the need for frequent and careful inspection to enforce the gathering of the affected fruits before the grub matures, as after they escape from the fruits many of them are bound to get lost, and nobody can successfully gather such fruit off of trees more than 10 ft. high. Most of mine are kept under 8 ft. in height I am quite satisfied that all other treatments and regulations put together are as nothing compared to this question of early gathering of affected fruits. But if this work is so particular with us, where we only have one brood, how much more necessary is it for you with two or three broods? This work, however, will not be done without very strong persuasion, often in the Police Courts. In respect to spraying, the large orchardist would find it difficult to get over his orchards four times, or even thrice. I go over mine twice, and have obtained excellent results with these arsenical sprays, of which I prefer Paris green. As an instance of what can be done, the moth appeared some three years ago in one of my orchards containing some 4,000 trees, away in the bush in an isolated position. Directly it was discovered the trees were bandaged and every struck fruit gathered and destroyed as fast as they could be found. This season only about a dozen apples were struck, and we are hoping to have seen the last of it: the trees are low, clean-stemmed, and sprayed regularly. I train these trees with eight or nine cordon branches, which are closely spurred by pruning. I certainly think if your regulations could be enforced thoroughly the pest could be practically eradicated."

Mr. A. Hilmer Cato, of Paraceste, Hobart, repeats this lastnamed statement, and affirms the presence of only one brood in his neighbourhood, stating that the occurrence of a second brood is exceptional with him. He says: —"I think that it is absolutely necessary to legislate on this matter, if united action is to be secured. At the same time, the moth has overrun scores of our best orchards before the regulations were enforced. I think where the moth is thoroughly established in an orchard spraying is the only effective remedy. I sprayed this year with Paris green and lime in proportions as recommended in your pamphlet with very beneficial results. Our regulations do not compel us to spray, but I think orchardists should be compelled to spray or carry out the other regulations in entirety. I find the spraying cheapest, and most effective. I have known cases where the grub has been found in young orchards in isolated places, where, by bandaging and carefully picking off infected fruits, it has been completely eradicated. The trees should be kept down low to facilitate spraying, &c. With regard to the distribution and sale of affected fruits, it is necessary to be particular, as no doubt by that means the pest is conveyed into fresh districts, and otherwise propagated to a very great extent; but I see no legitimate reason why this fruit should not be treated so as to prevent the escape of the insect, and be afterwards allowed to go to the manufactory. In conclusion, I may say that with the knowledge obtained through long years of experience it is quite possible to effectually check, if not eradicate, the pest."

Rev. E. H. Thompson, of Franklin, a practical grower and trained entomologist, says:—"I have no hesitation in saying that if our (Tasmanian) Act were thoroughly carried out the pest could be practically exterminated. We have had many and repeated outbreaks of the moth in various parts of the island, and I am certain wherever the matter has been taken in hand in a systematic manner the trouble has been got rid of in a short time. The trouble lies in the apathy of those who allow big trees to remain year after year without attempting to cleanse them. I advise that all such old and big trees should be cut down, and if they showed sufficient vitality they should be regrafted. I have treated trees thus, and three years after received excellent returns; in fact, one tree this season had yielded fruit which sold for £3 2/6. It was a Beurre Clairgeau pear, and I put nearly 80 scions upon it when grafting. I know one grower who, at Launceston, saved a very large proportion of his fruit in the midst of an infected district by spraying with arsenate of lead. Paris green has been used by many growers with success. Our chief trouble for a long time was the impurity of the drugs employed, causing not only a great waste of time, but much discouragement. After an experience of 25 years I have no hesitation in saying that more can be done by united action than otherwise. It is no use one man slaving away if his neighbours are at liberty to reinfect his trees again. I can produce unquestionable evidence of the existence of two broods of the insect in this locality, as the presence of empty chrysalides in the bandages is of common occurrence. I would adopt the following methods, viz.:- Insist on all rubbish that would harbour the pest being destroyed. Bandage the trees all the year round, as it is an unquestioned fact that frequently the grubs which have wintered under a clod or other shelter will leave their quarters at the commencement of spring and go up the trees just before pupating. During the period when the moth is active I would have the bandages removed every week and the grubs destroyed. I would also suggest catching the moths with a net. In an hour I have caught 37 moths in this way in an infected orchard about noonday. Every moth destroyed may mean the reduction of many possible grubs."

Mr. J. Langley, Sandy Bay, writes:—"I think your regulations are very plain, and the directions therein very good indeed. The trouble is it is so difficult to carry them out in detail. We have more power under our Codlin Moth Act to interfere and see that all infected fruit is destroyed. If your Act does not give you sufficient power to carry out proceedings against defaulters, you should have it, or else in your warm climate you will never succeed in reducing the pest materially. In respect to the sale of affected fruit our Act makes any person who sells, or offers, or exposes for sale any fruit infected with the moth shall be liable to a penalty not exceeding £5. We found a benefit in our district this season from using Paris green as indicated. We can point to orchardists who saved 90 per cent. of their fruit. All trees, if possible, should not exceed 10 ft. in height, so as to spray more completely and rapidly. We find picking off infected fruits and destroying them a great help, as the apple itself is the best trap."

Mr. F. F. Butler, of Moonah, affirms his belief in the presence of one brood only during each year in his locality. "To keep the pest under control legislation and strict inspection are absolutely necessary, as some growers will be careless, to the injury of their neighbours, and cultivate the pest by neglect. Every one of the growers requires to be kept up to the work. I have found that submerging the infected fruits in water for 48 hours is not to be depended on to kill the grubs. We keep our trees low, about 8 ft. is the average, and all tall or old trees should be cut down and regrafted, or grubbed up. The most important regulation is the picking off and effectually destroying the infected fruits. The apple is the best trap, but as very many escape the bandages fortunately get a large proportion of these, but some get into the ground, and cause mischief the following year. I have found that spraying with insecticides useful in diminishing the pest, but more skill than is generally available is necessary to do it properly, and badly done it is dangerous to the trees. I have lately been spraying with McDougall's sheep dip, and this was more effectual than the arsenical sprays. I spray once a month for four months, the first just after the fruits have set. After taking these precautions I harvested 4,000 bushels of clean, good fruits from 20 acres of apple trees, and reckon I picked off and otherwise lost through the moth about 400 bushels."

Mr. L. M. Shoobridge, of Glenora, replied as follows—"In the main your regulations are similar to ours, and I think are quite strict enough, and if carried out should keep the pest in check; but I don't think it possible to eradicate the pest absolutely. I have had experience now over eight years with about 80 acres of apples and pears. I have relied on picking and destroying infected fruit and bandaging. I have found here that to roll a piece of sacking and push it tightly into a fork is far more effective in securing the grub than fastening it round the stem, as the grub likes a dry place. (In Tasmania more rain falls during the summer than in S.A.) I have been able to keep the pest in check; it costs a good bit bandaging over 10,000 trees and searching for infected fruits; but in all not much over 10/ per acre per annum. Out of 30,000 bushels this season at the outside I don't think there were 200 bushels lost by grub. My trees are all low, and all work is done from the ground. I am favourably situated, no other orchards being near to me. The orchard is only slightly infected, as from the outset I have never omitted to bandage and pick all the infected fruits we could find. Some orchardists here are spraying with good results, but this is where the pest is very bad, and other orchards near, but I cannot speak from my personal experience in spraying."

Mr. Thomas Brimfield, of Kangaroo Valley, writes:—"From my own experience I now consider the codlin moth a harmless pest if properly treated; if not, it means ruin here in our State. The sprayings must be given fortnightly, and done systematically. I spray four times with Paris green, 1 oz. to 7½ gallons of lime water. I don't believe I lose 1 per cent. of my fruit, while some orchards not far away not treated lose nearly 80 per cent. No tree should be more than 8 ft. high where there is codlin moth. Cool days are the best for spraying, and it does not matter about your neighbours not spraying, even if you are in the midst of them."

Mr S. W. Gould, of Tolosa, Glenorchy, who, before becoming a fruitgrower, was an inspector under the Codlin Moth Act for nine years, writes as follows:—"The old trees must be cut down to a reasonable height or grubbed out altogether, as it is useless to try to cope with the moth otherwise. The secret of the whole business lies in gathering and destroying the infected fruit in an effectual manner before the grub escapes from the fruit. The bandages are very essential, and absolutely necessary to catch the grubs coming from fruits missed in the picking off. We only have one brood, consequently our labour with the bandages is reduced in summer. We would not begin spraying here until the first week in December, as the moths only begin to emerge at that time. The material used here for spraying is Paris green, 1 lb. to 150 gallons of lime water. No infected fruits should be allowed to leave the orchards before it has been properly treated to kill the grubs."

Mr. H. S. R. Wright, of Glenorchy, says:—"As Chairman of our Fruit Board I have frequently ordered the destruction of old trees which were overhanging sheds or were decayed in the stems. All new orchards are with us kept low, to avoid ladder work. For the last few years we have gone in largely for spraying with increasing success, and we are beginning to feel that the old methods of bandaging, &c., now enforced by law here will shortly be superseded by frequent and systematic spraying. It is proved here in this locality we have but one brood annually, although we have early and late grubs. Still, none hatch a second time. It is, of course, necessary to keep on picking off and destroying all infected fruits throughout the summer, though this is rarely done thoroughly. We spray three or four times each season, first just as the apple forms, and in large orchards it means that we do not stop until the end of January. I have had excellent results from the use of Paris green. I do not know any one who has used arsenite of soda in this State."

It might be of use to explain that the Tasmanian Codlin Moth Acts give growers the right to ask that a certain area be proclaimed as a fruit district; the fruitgrowers therein proceed to elect a board. This board is empowered to rate all orchard lands up to 6/ per acre. The funds are used in paying for inspection and otherwise carrying into effect the provisions of the Act. The whole work is under a Chief Inspector, who is a Government official, and to whom the local inspectors must report. The appointment and control of the local inspector, however, devolves upon the local board, which makes its own regulations. Several of the gentlemen from whose letters I have quoted uphold the principle incorporated in the Act, but deprecate the rating of young orchards under three years of age, and complain somewhat bitterly about the too palpable effect of local influence in the methods of carrying out the regulations, suggesting as a remedy that full control of the local inspectors should be held by the central authorities.

A COMPARISON OF RAINFALL AND WHEAT YIELDS.

By J. McColl, Richman's Creek.

In looking over the rainfall recorded at our farm near Kingswood, since 1888, I thought a review of the past 14 years and comparisons of the average yields of wheat might prove of some interest to the members of the Agricultural Bureau. The figures will show that it is not so much the quantity of rain recorded as the time of the year that it falls that governs our returns. It will be seen that almost invariably when the season opens with good rains in March, April or May, we have had good yields, while with few exceptions with dry weather during the months mentioned, the season has resulted in indifferent or very poor yields. Although we have been here since 1877, it was not till 1888 that we commenced to keep records of rainfall. The following table gives details of the rainfall recorded at the farm of Messrs. A. & J. McColl, from that year; also the average yields from the whole of the land under crop each year:—

	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902
Jan. ..	·13	2·74	4·80	·67	·67	—	·04	1·52	1·36	·49	—	·07	·19	—	·13
Feb. ..	—	·31	1·44	—	·13	—	·03	·01	·12	.51	·46	1·08	·16	·58	·43
March ..	·15	·19	·34	·14	—	·25	·12	·11	·34	·11	·22	1·16	2·59	·03	·74
April ..	·43	5·09	1·35	3·44	·34	2·32	·72	2·86	·38	·11	·76	·93	·95	·65	·39
May ..	1·20	3·56	1·57	·16	·62	8·61	·79	·26	·59	·36	·66	1·03	1·09	·13	·13
June• ..	1·46	3·77	2·32	2·89	·56	2·40	1·48	1·42	·82	1·35	5·56	3·26	2·35	·90	1·18
July ..	1·03	1·02	4·31	1·00	·65	1·54	1·08	2·24	1·91	3·05	1·14	·85	1·32	1·77	·19
August ..	·94	2·89	3·06	1·98	2·28	1·35	1·56	1·31	1·15	1·10	4·22	1·06	1·45	2·45	—
Sept. ..	·64	1·14	·85	·73	4·87	1·55	1·28	1·36	·83	1-10	·15	1·63	·68	·98	—
Oct. ..	·04	2·24	·85	·89	4·85	·49	2·89	·13	·15	·36	·59	·59	·29	2·04	—
Nov. ..	·18	·71	·85	·41	1·58	1·64	·82	·62	·57	·17	·14	·56	·18	·20	—
Dec. ..	·62	·05	·18	·37	·66	1·05	4·34	1·52	·86	·09	—	·08	·51	·19	—
Totals ..	6·82	23·71	21·92	12·68	17·21	21·20	15·15	13·36	9·08	8·80	13·90	12·30	11·76	9·92	—
Average yield of Wheat per acre (bushls.)	1½	16	10	14½	16	14½	10½	5½	¾	4¾	7	14	14	6	—

It will be seen that 1888 has been our driest year to date; the only months when any approaching an inch of rain being recorded were May, 1.20; June, 1.46; July, 1.06; and August, 0.94. The total fall from the end of July to end of November was 1.80. On fallow we reaped 5 bushels, but the rest of the land brought the average for the farm down to 1½ bushels. 1899 was our wettest season. Five inches fell in April, and good rains were experienced right up to November; the yield was 16 bushels pere acre. The following year was also wet, but it was a peculiar season. Over six inches fell in January and February, and a lot of damage was done to the wheat heaps.

The rains in the early seeding season were not very satisfactory, and during April and May, the grasshoppers did a good deal of damage to the wheat above ground, necessitating the re-sowing of a portion of the crop. The total rainfall was 21.92 inches, and the yield 10 bushels.

1891 was a good year, although the rain recorded was only 12.68 inches. The fall was, however, very seasonable, 3½ being recorded in April, 0.16 in May, 2.89 inches in June, and nice rains until the end of October. Our yield was 14½ bushels. The following year (1892) the rain, for a good season, was the latest on record, light showers only being recorded up to August 6, when good rain set in, and the month's record was 2.28 inches. September and October each recorded over 4¾ inches, and November 1½ inches, the total for the year being 17.21 inches, and the yield 16 bushels. 1893 opened well with 2¼ inches in April, 8½ in May, 2½ in June, and about 1½ inches each July, August, and September. The yield for the season was 14½ bushels per acre..

The next year, 1894, the rain was again late, less than inch being recorded in April and May. Afterwards the season greatly improved, over 8 inches being recorded in five months. The yield was 10½ bushels. 1895 showed the rainfall still on the downgrade; the total being 13.36, of which January and December accounted for three inches, which were of little if any use to the crop. Good rains (2.86), fell in April and July, but otherwise it was light, and the crop only averaged 5½ bushels.

1896 gave us the lowest yield on our record, although the rainfall was 2¼ inches above the 1888 record. Taking the whole area sown we only reaped ¾ bushel per acre, a large proportion of the crop not being worth reaping. Only two months of the growing period showed a rainfall of over an inch, viz., July 1.91 inches, and August 1.15 inches. The total this season was 9.08 inches, and low as it was the current year's (1902) fall to end of July is less by 2½ inches, than the record that year to same date. Although the rainfall for 1897 was less than the previous year the crop was better, the rain falling at a more seasonable time. Up to end of May only 1½ inches had fallen, but June gave nearly 1½ inches, July 3 inches, and August and September each over an inch. The rainfall was 8.80 inches, and the yield 4¾ bushels.

Another peculiar and late season was experienced in 1898; there were only light rains up till June, but in that month 5½ in. fell; July gave 1 in., and August 4¼ in. The total was, however, only 13.90 in., and the yield averaged 7 bushels. During September the crops made phenomenal growth, and were looking very promising, but at the end of the month and throughout October they suffered severely from hot north winds. The following season saw the rainfall lower, but the season was more favourable; with 1¼ in. less rain the crop averaged 14 bushels, just double the previous crop. January was to all intents rainless, but each of the next four months gave 1 in., June 5.26 in., July 0.85 in., August 1.06 in., and September 1.63 in. The weather altogether was milder than the previous season.

1900 saw the rainfall still dwindling, the record being 11.76 in. Towards the end of March 2 in. fell, April gave nearly an inch, May 1 in., June 2 1-3 in., July 1 1-3 in., and August 1½ in. The rest of the season was dry, but the crops having a good early start ripened quickly and well, and averaged 14 bushels. On fallow land the average for these two years was 18 bushels, but the unfallowed land brought the whole average down considerably. 1901 was another late season, with very light rains up till July, when 1¾ in. fell, August giving nearly 2½ in., and September less than an inch. Two inches in October saved the crop, and although the total for the year was only 9.92 in. we averaged 6 bushels per acre.

In looking back over 25 years' experience in this district I feel fully convinced that cultivation and a careful selection of seed has been strong factors in keeping up the yield. In the earlier years of our farming in the north we found from experience that without good cultivation, such as early fallow, and careful selection of early and medium varieties of seed, we could not, even with a fair rainfall, depend on a good average yield; hence we have tried to improve on past experience, and I think we have partially succeeded. I can see many things in the past on which we might have improved, but I think we have done a little, and that little has proved to us that we were working on right lines. Some tell us we are lucky in getting such returns. All I can say is, our success has not been without a good deal of labour and attention to detail. For the last three seasons we have used superphosphates with varying success.

Now a word or two on the present outlook, which, with only 3½ in. of rain for the season to date, is anything but cheering. Still, although I do not feel sanguine of big returns, I believe there is ground for hope that we may get a little yet; 1877 was the first year in which wheat was grown around here, and in that season there were good rains at seed time, but for three months afterwards there was practically none; the wheat plant was almost gone out of sight, and yet with 3 in. about the middle of September, and very little rain afterwards, a 10-bushel harvest was reaped. If we can argue from past experience we may expect at least 4 in. more before the season is out, and if we get that within a month it would give feed for our stock and a small return from the crop.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of August, 1902:—

Adelaide	1·14	Manoora	1·13	Macclesfield	2·35
Hawker	0·41	Hoyleton	0·86	Meadows	2·58
Cradock	0·30	Balaklava	0·51	Strathalbyn	1·28
Wilson	0·30	Port Wakefield	0·90	Callington	1·15
Gordon	0·28	Saddleworth	1·24	Langhorne's Bridge	1·25
Quorn	0·48	Marrabel	1·11	Milang	1·55
Port Augusta	0·41	Riverton	1·34	Wallaroo	0·45
Port Germein	1·16	Tarlee	0·84	Kadina	0·92
Port Pirie	1·11	Stockport	0·81	Moonta	0·65
Crystal Brook	1·75	Hamley Bridge	0·93	Green's Plains	0·81
Port Broughton	0·69	Kapunda	1·23	Maitland	0·88
Bute	0·58	Freeling	1·02	Ardrossan	1·05
Hammond	1·33	Stockwell	1·27	Port Victoria	0·57
Bruce	0·52	Nuriootpa	1·55	Curramulka	1·18
Wilmington	1·37	Angaston	1·85	Minlaton	0·89
Melrose	1.67	Tanunda	1·58	Stansbury	0·76
Booleroo Centre	1·05	Lyndoch	1·37	Warooka	0·72
Wirrabara	1·23	Mallala	0·85	Yorketown	1·04
Appila	1·48	Roseworthy	1·05	Edithburgh	0·88
Laura	2·08	Gawler	0·98	Fowler's Bay	0·48
Caltowie	1·20	Smithfield	0·55	Streaky Bay	1·03
Jamestown	1·07	Two Wells	0·85	Port Elliston	0·93
Gladstone	1·03	Virginia	0·84	Port Lincoln	1·33
Georgetown	1·21	Salisbury	0·69	Cowell	0·79
Narridy	1·02	Tea Tree Gully	1·38	Queenscliffe	2·09
Redhill	1·06	Magill	1·54	Port Elliot	1·56
Koolunga	0·95	Mitcham	1·65	Goolwa	2·29
Carrieton	0·73	Crafers	3·08	Meningie	1·27
Eurelia	0·85	Clarendon	2·75	Kingston	2·07
Johnsburg	1·73	Morphett Vale	2·02	Robe	3·18
Orroroo	1·07	Noarlunga	0·91	Beachport	3·65
Black Rock	1·06	Willunga	1·69	Coonalpyn	1·43
Petersburg	1·28	Aldinga	1·16	Bordertown	0·99
Yongala	1·19	Normanville	0·98	Wolseley	0·63
Terowie	1·31	Yankalilla	1·30	Frances	1·26
Yarcowie	1·23	Eudunda	1·70	Naracoorte	1·64
Hallett	1·34	Truro	1·36	Lucindale	2·00
Mt. Bryan	1·33	Mount Pleasant	1·71	Penola	2·87
Burra	1·45	Blumberg	2·12	Millicent	3·43
Snowtown	0·81	Gumeracha	2·45	Mount Gambier	3·36
Brinkworth	0·75	Lobethal	2·55	Wellington	1·38
Blyth	0·94	Woodside	1·93	Murray Bridge	1·28
Clare	1·30	Hahndorf	2·03	Mannum	1·02
Mintaro Central	1·51	Nairne	2·21	Morgan	0·88
Watervale	1·97	Mount Barker	2·83	Overland Corner	0·37
Auburn	1·48	Echunga	1·81	Renmark	0·24

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Co. report on August 30:--

The weather during August was not very favourable for the young wheat, no good subsoil soaking being reported even from the wetter districts, and although the plant is coming along nicely there, a lot of rain will be needed to assure prospects of good crops, whilst in many of the drier areas all hopes of obtaining even seed has been abandoned, and another year has apparently to be added to the long list of failures in those parts. Pastoralists also are crying out for rain, although probably we are not quite so badly off in this respect as stockowners in some portions of the neighbouring States.

The precarious position of the farming community is affecting business, especially in the country, but town traders also are complaining of general dulness. The prospects of the new goldfield at Tarcoola do not seem to brighten, if we may judge by the heavy fall in value of shares in the leading productive mine there.

Reports of bountiful crops now being reaped in America, especially Canada, and generally favourable accounts from Europe, notwithstanding heavy summer rains in some parts, point to the probabilities of an over-average wheat crop being reaped this year in the Northern Hemisphere. In Australia the market has been controlled by the necessities of Sydney, which has continued to draw heavily for wheat, especially from Melbourne, where price ran up to 4/8½ f.o.b. In this State, owing to heavier freights ruling, price did not reach quite so high, but we know of a sale of 1,000 bags extra prime sample of wheat at 4/8, bags in. Flour has moved in sympathy. Quite an exciting month has been experienced in forage lines, bran and pollard jumped up fully 3d. a bushel, but have steadied back a bit. Hay and chaff had unusually heavy business, owing to Sydney buying orders for large parcels coming on this market. For a week or two considerable excitement prevailed, and a lot of hay exchanged hands at extreme rates, but quotations are now a little easier. Feeding grains are also a shade firmer, but with the close approach to the hay harvest we do not expect much further advance, in fact, although price is high, trade in the line is very dull.

The relative lower values of Mount Gambier potatoes when compared with Tasmanians at time of writing last led to improved demand during the month for the local tubers, and as stocks diminished an advance in price showed, quotation improving 20/ a ton. The interstate market is also better, so that all round potatoes are dearer. A spurt in onions occurred, and for a few days it looked as if extreme rates would prevail, but stocks throughout Australia appearing to be heavier than was thought; as the season is getting late and holders were not inclined to risk a reaction set in, and values are back to last quotations.

Buyers looked for a rapid run down in the price of butter early in August, but rain keeping off and heavy demand on the Victorian market setting in from Queensland and New South Wales, that market further advanced, which caused prices to sustain here until a week ago, when the seasonable fall set in, a drop of about 5d a pound being shown, since, with the probability of export values shortly being reached, although the prospects render it doubtful as to there being much, if any, to spare for shipment this year. Eggs, as expected, have shown the seasonable tendency towards lower values, but still maintain a higher average than usual, the continuing excessive price for butcher's meat causing increased consumption of both eggs and bacon. A few export orders for the latter soon brought quotations closer up to Sydney and Melbourne rates, but this market is still a shade lower, and the extreme prices that are being paid for pigs render it very probable that further advance in bacon and hams must occur. In cheese also the market has firmed up, quotations having advanced about 2d., and the unfortunate prospects of the season renders it likely that this State will have to continue importing a part of her requirements the dearness of meat again creating greater demand in this also. Honey is selling freely at the advanced rates. Beeswax very saleable. Almonds in good demand at improved price.

Excellent demand exists for carcase meat, so that heavy catalogues at each Friday's sale have been realising high rates, especially for fine shop porkers. Good fed veal has also been selling well but poor stuff is neglected. The market for poultry has been a bit uneven, but on the whole satisfactory sales were made, though turkeys continued to sell relatively cheap.

MARKET QUOTATIONS OF THE DAY.

Wheat.—Port Adelaide shipping parcels, f.a.q., 4/6 to 4/7, f.o.b.; farmers' lots, 4/2 to 4/3 on trucks, per bushel 60 lb.

Flour.—City brands, £9 5/ to £9 10/; country, £8 10/ to £8 15/ per ton 2,000 lb.

Bran and Pollard.—1/6½ to 1/7 per bushel of 20 lb.

Oats.—Local Algerian and Dun, 3/3 to 3/5; prime stout feeding, white, 3/9 to 4/ per bushel 40 lb.

Barley.—Malting, 4/6 to 5/; Cape, nominal at 3/6 per bushel 50 lb.

Chaff.—£6 10/ to £7 per ton of 2,240 lb., bags in, dumped, f.o.b., Port Adelaide.

Potatoes.—Tasmanian, £7; Mt. Gambiers, £5 15/ to £6 per 2,240 lb.

Onions.—Local Spanish, £6 10/ to £7 10/; Mt. Gambier, £8 per 2,240 lb.

Butter.—Creamery and factory prints, 1/2½ to 1/3½; private separator and best dairy, 1/1 to 1/2; well graded store, 1/ per lb.

Cheese.—S.A. Factory, 7½d. to 8½d.; N.Z. to 10d. per lb.

Bacon.—Factory cured sides, 9½d. to 10½d.; farm lots, 8d. to 8½d. per lb.

Hams.—S.A. factory, 10d. to 11d. per lb.

Eggs.—Loose, 6¾d.; in casks, f.o.b., 8½d. per doz.

Lard.—In bladders, 10d.; tins, 9d. per lb.

Honey.—3d. for best extracted, in 60-lb. tins; Beeswax,, 1/2 lb.

Almonds.—Fine soft shells, 5½d.; kernels, 10½d. per lb.

Carcase Meat.—Bright shop porkers, 6d. to 6½d.; fair to good baconers, 5½d. to 6d.; rough choppers to medium stuff, from 3d. to 4¼d.; veal, prime carcases, 3d. to 4d.; poor to ordinary stuff, 1d. to 2½d. per lb.

Dressed Poultry.—Turkeys realised 7d. to 8d.; fowls, 5½d. to 6½d. per lb.

Live Poultry.—Heavy weight table roosters sold from 1/9 to 2/3 each; good hens and fair cockerels, 1/2 to 1/6; poor and light birds, from 9d. to 11d.; ducks, from 2/ to 2/6; geese, from 2/6 to 3/3; pigeons, 4d. to 6d.; turkeys, from 5d. to 6½d. per lb. live weight for ordinary to good table birds.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are city auction mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

DATES OF MEETINGS OF BRANCH AGRICULTURAL BUREAUX.

With a view of publishing in the "Journal" the dates of meetings of the Agricultural Bureaux, Hon. Secretaries are requested to forward dates of their next meeting in time for publication.

BRANCH.	Date of Meeting.	BRANCH.	Date of Meeting.
Amyton	Sept. 19	Nantawarra	Sept. 17, Oct. 15
Angaston	13	Naracoorte	6
Arthurton	18	Nirridy	20
Balaklava	6, Oct. 11	Onetree Hill	19
Booleroo Centre	15	Orroroo	19
Bowhill	20	Paskeville	20
Burra	19, Oct. 10	Penola	20
Caltowie	18	Port Broughton	15
Cherry Gardens	9, Oct. 14	Port Elliot	20, Oct. 18
Clare	12, 17	Port Germein	13
Colton	6	Port Lincoln	20
Crystal Brook	20	Port Pirie	20, Oct. 18
Eudunda	15	Pyap	10
Finniss	20, Oct. 6	Quorn	20
Forest Range	18 16	Reeves' Plains	12
Gawler River	12	Renmark	18
Kingston	20, Oct. 4	Rhine Villa	13
Koolunga	18 16	Riverton	13, Oct. 11
Lyndoch	18	Saddleworth	19
Maitland	6, Oct. 4	Stansbury	6, Oct. 4
Mallala	15	Stockport	16
Mannum	12	Strathatbyn	18
Minlaton	6	Tatiara	20
Morgan	13	Wilmington	17, Oct. 15
Morphett Vale	2	Yankalilla	5 3
Mount Compass	13		

CONFERENCE OF SOUTHERN AGRICULTURAL BUREAUX, PORT ELLIOT, AUGUST 14.

A conference of Branches of the Agricultural Bureau was held at Port Elliot on Thursday, August 14; the following delegates being present—

Finniss—Messrs. S. Collett and A. E. Henley.

Strathalbyn—Messrs. M. Rankine, G. Sissons, W. M. Rankine, J. H. W. Mules, G. J. Reid, and J. Cheriton.

Mount Compass—Messrs. A. J. Hancock, C. S. Hancock, R. Peters, F. Slater, and D. J. Hutton.

Port Elliot—Messrs. J. McLeod, W. E. Hargreaves, W. W. Hargreaves, O. B. Hutchinson, H. Welch, H. Gray, F. Basham, S. Inglis, H. Pannell, J. R. Coote, and J. Brown.

Department of Agriculture—Professor J. D. Towar and Mr. Geo. Quinn.

EFFECT OF MANURE ON PASTURES AND ON LIVE STOCK.

Mr. J. Chibnall of Finniss forwarded a paper on the effect of manure on pastures, and on live stock. The following is an abstract of the paper:—

I have tried several manures on pasture lands, and am convinced that they improve the feeding qualities of pastures in the same way that manure improves the feeding qualities of hay. Four years ago I broadcasted 1 cwt. of mineral super on about 1 acre of pasture land that had never had artificial manure before, and the effects are plainly seen this season. The land was sandy loam. Three years ago I broadcasted 1 cwt. of Thomas phosphate on about 1 acre, and up to the present have noticed scarcely any difference in the growth of the grass. This land was black alluvial flat. Last year I broadcasted 2 cwt. of guano super on about 2 acres of sandy loam with the result that it does not show up any better than the mineral super sown four years ago. I also broadcasted some bonedust on sandy land, and some on black alluvial flat, but so far this season I cannot see much difference in the grass; if any, it is on the sandy land. This year I broadcasted about 14 acres at the rate of 1 cwt. of mineral super to the acre, with the result that the grass grows quickly whenever we have suitable weather. Where these experiments have been carried out the rainfall during the last seven years has been about 15 in. per annum, and I have come to the conclusion that a manure for pasture land must be water soluble; with a heavier rainfall a less soluble manure might do.

And now we come to the effect manuring pasture lands has on live stock, and it appears to me that most of our land is deficient in phosphate of lime, and no doubt we shall have to supply nitrogen and potash later on. Look at some of our live stock draught horses especially; in this district they are getting smaller each generation, lacking bone and substance. Are they anything like the horses we bred 30 or 40 years ago? A good many things are blamed, but I think after all it is the bone forming material is lacking in the feed. Look at our dairy cows? Where are the cows that will make 800 lb. of beef when they are done as milkers? They are subject to all sorts of diseases, getting smaller each generation. Surely there is something wrong with the pastures. I say, farmers, graziers, manure your lands with phosphate of lime; future generations are depending on it.

Mr. Sissons did not altogether agree with the views expressed in the paper, and thought the breeding had more to do with the deterioration of the stock than the feeding. Mr. Cheriton believed in the possibility of improving the pastures by using artificial fertilisers. With him Thomas phosphate had not proved a success in this direction. A locally compounded grass manure had produced some results though not of a very marked character as yet. He had five plots and believed the results would be more decided if more moisture were available. It was a mistake to think that grazing off the fodder would fully keep up the feeding value of the land. The taking away of stock raised upon the land removed the fertility as assuredly as if taken in grain or any other crop. Forty years ago he had used a couple of tons of coarse bonedust on some land, and it improved the grass in quality and quantity a fact soon demonstrated by the stock placed there to graze. The effect upon the rising generation would probably not be so marked as the writer anticipated, but the statement that well fed meat would help to build up strong framed men and women, he thought would stand criticism. Mr. McLeod said the soil needed reinvigorating, but at the same time judgment should be used in breeding stock. He remembered 12 years ago a local resident using 2 cwt. of bonedust to the acre, and the effect was still noticeable on that land. It was generally accepted now, that feed growing on land that had been manured for grain was much improved in nourishing qualities. He got better crops of grass after such a process. The depreciation of the stock was more due in his opinion to the breeders now using a different class of animal. Mr. Welch had used 4 cwt. of guano to the acre seven years ago, and the effects were good yet. Probably the dose was strong, but at the time he was sceptical of the value of the guano, and he used more than was recommended. He had used coarse bones, and although no result could be noted for several years, the effect was very clearly seen to-day. It was sown on top, ploughed in, and left undisturbed. Professor Towar, in answer to a question, said if the rainfall were sufficient surface sowing would act all right, but in the absence of much rain the manure must be mixed with the soil. In England lawns and pastures had been top-dressed with good results for over 100 years without being broken up. The statement made in a pamphlet issued by a local firm respecting the constituents of a grass manure was apt to mislead the farmers into thinking that tricalcic phosphate was soluble in water, as such was not the case. Mr. Collett had used Bally bonedust three years ago, at the rate of 175 lb. per acre, and the effect was so good that the next season the growth of grass was cut for ensilage. If he were carrying on further treatments he would mix a superphosphate with the bonedust to give the feed a rapid start.

CO-OPERATION.

Mr. Slater, Mt. Compass Branch, read a paper on "Co-operation Among Producers." He urged the claims of the Farmers' Union for support, and would extend the operations of the Union to the buying and selling of products, and requisites of the cultivator of the soil. There was no reason, other than lack of support from those most interested, why the Union should not become a sort of Universal Provider for farmers, gardeners, &c. Members would be able to purchase all their requirements at lowest rates, and at the same time dispose of their crops and produce at least expense. Mr. W. M. Rankine in answer to questions explained the methods of working adopted by the South Australian Farmers' Co-operative Union.

FARMING AND GENERAL AGRICULTURE.

Mr. A. E. Henley read a paper on this subject to the following effect:—

He would deal first with the question of manures by giving their experience of their use. In 1888 they cleared 75 acres of land, and got 8 bushels of wheat per acre· but for the rust the yield would have been quite double. The following year the crop only gave 10 bushels, the next year 6 bushels, and the fourth year, from 60 acres they cleaned 30 bags of wheat. As it was evidently no use continuing cropping under these circumstances the land was left out of cultivation for seven years, and then fallowed The following season 67 acres were sown to wheat and 8 to oats, 120 lb. of Thomas phosphate (18 per cent. to 20 per cent. phosphoric acid) being drilled in with the seed To give it a fair trial he shut off the manure on several strips. From the whole paddock he reaped 250 bags of wheat and 52 bags of oats, but the unmanured strips did not yield 5 bushels per acre. The next year he used 120 lb. mineral super per acre; from 60 acres he got 250 bags of wheat, and from 15 acres cut 35 tons of hay. The following season 112 lb. per acre of Thomas phosphate, 15 per cent. grade, was applied; 60 acres cut 95 tons of hay, and 15 acres yielded 60 bags of wheat. This season, as he intended leaving the land out after this crop for two years, he applied 130 lb. of bone super, and the crop is promising well. He thought one reason for his success was that he had applied different manures, as where he had used mineral super for two years in succession the results were not so satisfactory. The crop came up all right, but did not hold out and yield so well.

There was also a good deal in the selection of seed; he never used the same seed more than twice on the same land. His plan was to grow wheat for two years, then change to oats or oats and wheat mixed for hay. He found this mixture makes the best hay, and gives every satisfaction chaffed. If wheat is grown too frequently the plants will die out in patches. It was best then to leave it out for a year or two, or change to oats as he found they grew well on these patches.

When fallowing plough 5 in. or 6 in. deep, breaking the soil up well. Roll it immediately after harrowing. The surface will then not set so hard as if left till rain comes. Stubble land need not be ploughed more than 4 in. deep. Start sowing early in May and finish by middle of June. To make the most of the stubble and the feed not required for the working stock keep a few sheep. This refers to farms of 200 to 300 acres where dairying is not practised. Buy, say, 40 good merino or crossbred ewes, and cross with a Shropshire or crossbred ram. Keep these on the grass land all the year. At Christmas the lambs should fetch 8/ to 9/ each, or they can be disposed of at first opportunity when they are fit. For the stubble, for 150 acres, buy 100 to 150 good crossbred wethers; if in good store condition they will fatten on the stubble, and half should be sold in two or three months if 2/ to 2/6 per head over price paid can be obtained. The remainder can be kept until ploughing time, and then sold fat to the butcher. If they tried to keep all until then they might not keep fit, and there was some risk that they would have to be sold as stores. It was always better to have 20 sheep less than the land will carry than 20 too many. There was more profit in the lesser number without the same risk of loss. This also applied to other stock.

Mr. Henley, in reply to a question, said the mixed hay consisted of Purple Straw wheat and Algerian oats, in the proportion of two bags of the former to one of the latter. These sorts ripened together. Mr. Cheriton did not like either of these varieties for making hay. Mr. Brown had found with him. Kings early wheat and Cape oats did not ripen together, the latter being at least a week too late. Mr. Welch had used land without manure, and only cut half a ton of hay to the acre during a fair season. The following season he used 2 cwt. of bonedust on the same land and cut 1½ tons of hay per acre, the season being no better in a general way. For 14 years without a spell he cultivated the land, making a succession of crops composed of wheat, oats, and linseed, and never cut less than 1½ tons of hay to the acre, where manure had been used. After this he cultivated lower lands, using 2 cwt. guano to the acre, and for four years in succession he grew not less than 35 bushels of barley, 70 bushels of Cape oats, and 40 bushels of wheat per acre. During the four years each acre cut for hay produced on the average a total of 11 tons. Last year he cut 1½ tons of hay to the acre on land, where before manuring was tried, the rust always affected the yields, the inference being that the manure-nourished plants were not so much affected by rust. Mr. Brown did not agree with Mr. Welch, as he grew the same class of wheat, used the same class of manure, on similar land, and in his case only the straw was affected by rust, as the wheat produced weighed 64 lb. to the bushel. He thought a particularly hot Sunday experienced at a critical time did more harm to the crop on Mr. Welch's land than did the rust. He believed that Leaks's rust proof wheat was resistant still, and had not, as some one had inferred, lost its powers of resisting the rust. Mr. McLeod spoke of the accuracy of the statement made by Mr. Henley, and he believed as good crops were grown there as anywhere in the district. He thought the manures showed better effects on the poor, cold, hungry lands than elsewhere. Manuring paid a handsome dividend, and it was worth risking the necessary expenditure incurred in purchasing and applying them.

SOIL FERTILITY.

Professor J. D. Towar addressed the Conference on "Soil Fertility." He said he trusted the practical farmers present would not misunderstand him when he said that after a residence here of three months, he was not prepared to give advice on farming operations in this State. He proposed to deal with general theoretical principles which held good under all conditions. Scientists tell us that in the beginning the earth's crust originated from the solid rocks. Many of the agencies that have been at work reducing them to powder are dormant now, or cease to act in a worldwide sense. The glaciers, with few exceptions, have ceased their action. Frosts did not exercise much action in this climate, but in cold regions they were still active agents in the soil-forming work. Running water was still actively engaged in rounding off the rugged surfaces of the rocks and distributing the slow won particles far and wide, and bringing them into a condition suitable for absorption by the plants. The wind carried particles of soil about, thus mixing and improving the fertility of some parts. Earthworms mined deeply, bringing up soil from the lower strata, and thus mixed it with the surface layers and also left cast-off portions of organic matter from their own bodies. At the same time they admitted moisture and oxygen to greater depths, encouraging the descent of the roots and widening their field of operations. The growing plant itself is probably the most interesting of all to us. The acids exuded by the plant roots have an action on the crude soil and rock contents somewhat analogous to the gastric juices of the animal upon the undigested substances eaten by it.

An interesting experiment showing this may be made by growing a plant upon a polished slab of marble in soil containing none of the constituents of that rock. Other conditions being equal the plant will grow and spread its roots upon the polished face of the marble. After a time, if the plant and soil be removed, examination will show that the polished marble has been etched into irregular furrows by the action of the growing roots. An analysis of the plant will show that it has absorbed substances from the rock which were not in the soil and could not be obtained through any other agency. This marble represents the condition in which a good many of the substances required to feed plants are at present found in our soils. To get the best results we must cultivate our soils and grow plants upon them, and furnish the elements now lacking. All of these food substances we were concerned about came from the soil through the roots. Carbon is taken from the air, but the mineral substances must come into the plant in water through the roots. The presence of the water combined with the action of the cultivation and the growing plant will slowly dissolve these particles, as the chemist in the laboratory with the assistance of strong reagents will do in a short time. Our agricultural soils are made up of compounds of some 13 or 14 elements, usually occurring in considerable abundance. Silica forms the body of the soil, and probably calcium (lime) need not be seriously considered. Other elements are usually sufficiently abundant, with the exceptions of compounds of potash, phosphorus, and nitrogen. This follows wherever investigations have been made on either side of the equator. Some soils seem to be in need of lime, but usually the three named above are most likely to run short. You have learned by practice that the addition of nitrogen appears to be not yet necessary here. Potash also appears as yet sufficiently abundant. Phosphorus compounds show themselves to be needful everywhere, and most necessary here. Fertilisers may act in a direct or indirect manner. He knew of soils on which a dressing of 200 lbs. to the acre of common salt increased the yield of carrots by 33 per cent., and yet analysis did not show the need for the elements found in salt.

The soils here showed an increase in production from the use of phosphatic manures, but it is quite possible these manures had also a secondary indirect action. He had a notion that they did; but it was as yet only a notion, and he merely suggested it in passing. He thought also that something else was needed here, and that was organic matter (humus). Soils may contain the plant food, and the conditions necessary for its release may not be present. The soil which does not contain a fairly liberal supply of phosphoric acid is scarcely to be found, but it is not always in a condition for the plants to get at. Phosphatic manures have given increased returns from soils where the analysis showed enough phosphoric acid to supply good crops for a period of four or five hundred years; but the applied phosphates were in a readily available condition for the plants, and those whose presence were shown by the analysis were not. The soils needed more humus, which could be partly supplied by the decaying roots of plants. By the evidence given there that day he believed this was borne out. One gentleman said he had applied bonedust to his land years ago, and could yet see the result of its action. The increased growth of vegetation on such land had added to the organic matter in it by a greater number of decayed roots and leaves being left in and on it. The phosphoric acid applied then was not all there now, but the continued or maintained increase in the growth indicated a secondary action, doubtless explained in the above manner. Humus was not valued so much for the plant food it contained, but that its presence favours the conditions necessary to plant growth. It holds moisture like a sponge. The acids in the humus favour chemical activities in the soil, as well as those fermentative processes now beginning to be more clearly understood, as the means whereby plant foods are brought into a condition suitable for absorption by the root hairs. This was a suggestion for earnest thought, and not intended for advice. He had found it paid to grow crops with a view to keeping up the humus by turning under the sod which might be used for pasture. In doing so the physical condition of the soil was improved. He advocated "green" manures to keep up the fertility of the soil. Such had proved valuable in America, and doubtless, when accurately tested, would prove equally important here. He was pleased to hear such expressions respecting the value of commercial fertilizers in this State. They had both direct and indirect values. Some supply miss-

-ing elements, while at the same time they bring out and make available other elements present in the soil. The phosphates used come from various sources, but the source is of little consequence compared to the condition. Three forms are known to commerce, viz., insoluble in water, citrate soluble, and water soluble. The natural rock phosphates, bone phosphates or bonedust, phosphatic guanos, and Thomas phosphates, all belong to the insoluble section, and are not available for rapid absorption by the plants. After the chemist has applied his acid the citrate soluble and water soluble forms are created. A given quantity of bones dissolved in this way yielded a product of increased weight, but decreased in the percentage of phosphoric acid. He believed those who had studied the subject closely considered that it made very little difference whether the source of phosphoric acid was bones or the mineral forms, but it was generally accepted that the percentage of water soluble phosphate in the sample fixed its value. The Thomas phosphate secured from the iron-smelting furnaces is a tetra or four-lime phosphate, and is the least soluble form; but when finely ground this difficulty is to a great extent overcome. In his experience he had known old, sour soils to have been much benefited by the use of Thomas phosphates. The only advantage attributable to the bone superphosphate is the small quantity of nitrogen sometimes found in it. In this dry climate the question of the fertility of the soil was intimately bound up with the question of soil moisture, and his limited experience here made him hesitate to go into details of a local nature.

Mr. Slater had about 12 to 15 feet of humus in a swamp, but could not grow much upon it even with a 40-inch annual rainfall, unless he used some chemical manure, such as bonedust or Thomas phosphate.

Professor Towar thought most likely the soil lacked mineral matter, for this woodashes were useful if obtainable. Mineral phosphates and potash were usually good manures for such lands, but clay loam and burnt soil, if at hand, would probably supply all that was needed.

Mr. Brown suggested using two or three tons of lime to the acre.

Mr. Hutton asked if a combination of lime and salt made a good manure for such soils.

Professor Towar—Salt often set free other elements in the soil.

Mr. Peters said in small areas of the peaty land at Mt. Compass great differences were found. In some spots totally deficient of clay nothing could be grown. He had used loam from the hillsides with improved results in onion growing the first season, and he believed the results would be still more noticeable this season. He had found, as the Professor stated, that the use of peaty soil improved the stiff hillside land by adding humus to it.

Mr. Henley had put large quantities of stable manure on the land in a dry part of the State, and it did not rot away. He had also noticed such a lack of decay in old chaff heaps, but in this southern district after 12 months it all rotted and was practically incorporated into the soil.

Mr. M. Rankine asked for opinions on burning stubble versus ploughing it under? He had practised burning off stubbles or feeding them down with stock, but he thought these methods were questionable.

Professor Towar—Unless there is some very good reason for burning off the stubbles or chaff heaps, such as are due to disease or weed seeds, he would not do it. He believed in encouraging the growth of vegetable matter to turn into the soil.

Mr. Henley—Would you plough the dry stubble under?

Professor Towar—Yes; but not to crop it at once.

Mr. Sissons—Would stinkwort be beneficial if ploughed into the land?

Professor Towar advised ploughing it under if there was no danger of the seeds being planted thereby. The more mature the weed the longer it took to decay, therefore it should be ploughed under while sappy and green.

Mr. M. Rankine asked if the citrate soluble phosphate was as valuable as the water soluble?

Professor Towar liked about half the phosphate in a manure citrate soluble, because the high priced water soluble sample often proved of no more value owing to the fact that the plants did not, or could not, use up all of the water soluble phosphate in such a manure before a lot of it had reverted to the citrate form by combining with lime in the soil.

Mr. Brown thought more than phosphate was needed. Peas collected the nitrogen, and when grown prior to wheat, improved the yield very appreciably.

Professor Towar said the practice in vogue here would undoubtedly use up the nitrogen eventually, though nitrification during the long rainless season appeared to be very active here. He believed it would ultimately be necessary to apply nitrogen in some form. He suggested experimenting in the wetter districts with nitrate of soda or sulphate of ammonia, using about 40 lb. to the acre, and applying it in rainy weather to the growing crops.

Mr. Slater asked if the manures he had used (phosphates) were likely to be washed out of the soil by the heavy rainfall or by drains.

Professor Towar—You need not be afraid of losing your phosphates.

Mr. Welch asked would the acid in the manures injure the soil?

Professor Towar—The only action of the acid might be on the organic matter in the soil, and the nitrates might be dispelled. He did not believe—in reply to an interjection—in making a manure pile, but in putting it out on to the ground as soon as made by the animals, as quite 40 per cent. of the fertilising materials in it escaped when thrown up in the ordinary way.

Mr. Henley found that if carted straight out and spread on the land there was five times the bulk to handle compared with the heap system commonly followed, and there must be waste somewhere other than moisture.

Mr. Welch wished to know, if the manure were carted into the paddocks and spread out at once, would not some of the value in the manure escape by evaporation into the air, or be washed out by rain.

Professor Towar said if a certain weight of salt or sugar in solution were placed in a kettle and the moisture evaporated away the solid salt or sugar would be left in the kettle undiminished in quantity. You will lose nothing by evaporation of water into the air, and what the rain washes out of the manure will not be lost unless all the water runs off the land instead of soaking into the soil. When manure is heaped it ferments, slow combustion is set up, and great heat is evolved. It is while the nitrogen of the organic matter is being reduced to soluble nitrate and is passing through the ammonia stage that much loss is incurred, as the ammonia is very volatile and escapes into the air. By spreading out the manure this decomposition does not take place until the manure is incorporated into the soil, from which the escape of the nitrogen is not easy.

Mr. Brown—If I take a load of fresh stable manure and spread it on the ground in winter and plough it in would it give better results than if I put out the same quantity in summer and do not plough it under until the next winter?

Professor Towar said the test referred to had been made, and very little difference in yields had resulted. The early ploughing in, however, would allow the ground to settle underneath, and keep the moisture better than if ploughed in later, and the capillary action from beneath, by which moisture is drawn from lower strata, woud not be cut off.

Mr. Cheriton thanked the Professor for the assurance that stable manure could be as profitably used direct from the yards as when heaped. If it proved true, in his case much money would be saved on his farm, at any rate in the future. He would give the system a fair trial at once.

HANDLING AND SALE OF WOOL.

Mr. Wilch read a paper dealing with the classing, packing, and disposing of wool from the standpoint of the small sheepfarmer, to the following effect:—

During my five and twenty years' experience with wool I have not previously found much notice taken of the manner in which wool was prepared for market. Some of my neighbours still maintain that it does not signify, and will quote instances where one has skirted and another packed the whole fleece away just as taken off the sheep, their returns showing no material difference. I am convinced that carelessness in the get up of a clip of wool must now be a thing of the past to make the most profit. Buyers have been deceived in the wool they purchased through being too careless in examining into the bales before purchasing, but they are now much more particular.

I should advise farmers to breed or purchase one class of sheep when convenient in order to save the necessity for classing the wool. Let us deal with a mixed flock and see what is necessary. If you have sufficient paddocks, put your flock through the race just prior to shearing, or if you have no accommodation, run the sheep through while shearing, dividing out first one class of sheep, then another. At the same time any sheep that appear to carry inferior wool should be culled, or if shorn with others, the fleece should be carefully put on one side as inferior. If you have only one breed of sheep, note the different length of staple, drafting long and short and packing separately.

The shed should be substantial and waterproof, with plenty of light and room: containing a pen with a grating floor, in order to keep the sheep dry, and clean: also a boarded floor for the shearers to stand on; doors through the wall leading into pens outside the building where the sheep as shorn should be put in. Also have plenty of room for two or more wool presses, a wool table, and space for locks, &c

Pay your shearers a fair price, so that they may shear the sheep carefully: allow as few second cuts as possible; have the bellies taken off first. Don't let the fleece be broken when taken off.

The skirter or a boy now picks the fleece up tail end furthest from him, throws it on a table (prepared as a grating) outside of the fleece uppermost, takes off all dirt and stained wool round the edges, sees that no trimmings are left in the fleece, also takes off all burry wool down the leg part and jaws. Now, fold over the sides of the fleece, then over again, leaving the fleece about 15 inches wide, commence to roll up from the tail end, twist the neck portion into a sort of rope, run this round the fleece and poke the end in between the layers of wool thereby tying the fleece up. Be very particular to skirt all alike, and leave no dirt on whatever Sweep the boards after each sheep is shorn to prevent the trimmings getting mixed up with the fleece Have the floor washed daily or when it becomes greasy or dirty.

The fleeces being tied up place them in a corner on a clean floor until there are nine. Then hand them up to the man at the press, who then places the first fleece in the centre, the second in a corner, and works round the bale, trampling it in. Second row put one in the middle and commence in the lowest corner and so on. Make the bales as flat as posible on top; sow down neatly. Take the bale out and put it away, keeping it clean and dry. The bellies will be put in separate pack as taken off the sheep; cut the dirty piece off the centre and don't put dirty wool in this bale. Pieces also pack separately; keep them free from dirt. Locks can be put in bags, also grading them.

Bales need only be branded with initials and numbered on one or both ends Be sure to put the correct class of wool on the bale. Let this be neatly printed.

Why go to so much trouble? Probably that we may get better returns. Then avoid the middle man, except on rare occasions. Study the London reports and you will get a good idea whether best to sell locally or to ship; the whole expenses of shipping do not amount to £1 per bale. In Adelaide it is I find about 12 per bale. The difference in value last year between Adelaide and London prices would be nearly 3d. per pound, which means in my own clip over £100.

Mr. Cheriton believed what was said with regard to a good sample of wool would soon apply to every other product of the farm or garden. He believed if buyers offered more for the good sample of wheat or wool, better samples would be produced, and it will pay to make the best sample of every kind of produce.

Mr. McLeod said the Port Elliot Branch was indebted to Mr. Welch for taking the members down to his place, getting in sheep, and classifying the different points of value in connection with the wool. In practice he had demonstrated to them the points advanced in the paper. It was clear everything was on the advance, and farmers would have to take trouble with their products, as it would pay in the long run to produce an improved sample.

Evening Session.

Mr. Hargreaves read a paper on

PLANTING, PRUNING, AND MANAGEMENT OF AN ORCHARD.

Fruit trees should be grown on land set apart for the purpose, and the soil between them should not be cropped; at any rate not after the trees have been planted two or three years. Crops, such as potatoes or peas, grown between them while they are young, will do no harm, in fact will do good if you use a good sprinkle of bonedust; keep the land free from weeds and loose with the hoe. When the trees get a few years old they want all the moisture that is in the land. If you wish fine fruit the orchard should always be kept well worked; the ground being always loose, will absorb and hold the moisture and air, and the trees will thrive much better. Do not plough too deep close to the trees; always plough one way or you will break a lot of the surface roots, and will constantly be troubled with suckers from the damaged roots. If the land is wet it must first be drained well, for an orchard will do no good on land where the water stands in winter. After being well drained the land should be deeply ploughed or worked with the hoe. Then the places for the trees should be marked out with pegs 18 or 20 ft. apart, according to the variety; but if the orchard is at all a large one regular distances should be adopted for convenience of working. If the land is broken up in clods there will be too much air, and the soil will become too dry. Break it up finely, and in such a manner that the roots will not be injured. Cultivation or loosening of the surface is nearly as good as irrigation. When planting lay the longest and strongest roots in the direction from which the strongest winds come. When the tree is planted, cut it well back, above a bud that is pointing upward and outward. The object of pruning fruit trees is to encourage the production of blossom and the maturing of heavy crops of good fruit. If the pruning be too severe the tree will grow to wood. On the other hand, if the branches are left too thick they shade those beneath them, excluding the light and air, also encouraging a great growth of leaves, but very little fruit. The main thing in pruning is to have a good knowledge of the fruit bearing wood of different kinds of fruit trees, and to be able to form an early judgment as to the future productiveness of the various shoots and branches. This can only be obtained by practice and observation. There are many ways of training fruit trees, but the best for our dry climate is the round or umbrella shape; the spreading tops keep the roots moist and shaded. To train a tree this way it should be properly cut back from the first year after budding. When a stock is budded or grafted it will throw a straight stem the first year. On this the future head is to be formed. In the following winter this should be cut down to a height of about 1 ft. above the ground. Be careful to cut just above a good strong bud. the young tree will then throw out a number of shoots, and of these only the three or four strongest and best regulated should be retained; cut all the others off close to the stem during the summer, so as to give the full benefit of the sap to the remainder. This simple way of pruning carried out for a few years will produce a nice spreading tree, which will stand strong winds, such as we are subject to. When a tree is greatly overloaded with fruit it should be carefully thinned, as the fruit that is left on will become larger and of a better quality, and be more profitable An excessive crop of small fruit is very weakening to the tree, and of little market value. I will not say much on manuring an orchard, as you can get better advice by reading our Journal than I can give. Just one word to gardeners of small means. You can manure your trees with your fowls, and the only cost will be for a few large cases. Knock out one side and the bottom of a case, and put two cross-sticks about a foot from the ground for the fowls to roost; each case will hold six or seven full grown fowls. Put the case down at the foot of the tree. Leave it two or three nights in one place, and then shift to the next tree, and the fowls will follow the cases all over the garden. When you have a spare hour dig or hoe the manure in, and you will be surprised to see the difference in the growth. Keep as many fowls as you can feed and house properly, and the fowls will eat a lot of insects, such as codlin moth. I have seen chickens eating the American blight from the bottom of the fruit trees. Where the garden is exposed to the strong winds, we should grow a breakwind of some sort, such as pines, or sugar gums, or quick growing shrubs. They will pay for the land they occupy. A good breakwind saves the blossom as well as the fruit from being blown off. Any one interested in fruit culture cannot help observing the bad state of a number of the gardens in the south. Some people plant an acre or two of fruit trees, and then leave them to shift for themselves, with grass and rubbish a foot high. Such gardens are nothing but breeding places for codlin moth and other pests, and with many such gardens around him it is almost impossible for a man to keep a clean garden. The Codlin Moth Act was not worth the paper it is printed on when such gardens are allowed to exist. The only way is to keep the gardens clean, and all gardeners should do their best to keep them down. But get rid of them entirely we cannot, and the sooner we wake up to our own interests and all do our best to keep down such pests as the sparrows, starlings, rabbits, codlin moth, &c., the better it will be. Do not let us go to the Government for anything we can do for ourselves.

Mr. Brown wished to know if all kinds of fruit-trees should be budded?

Mr. Hargreaves.—Stone fruits are best budded, but pip fruits are more suited to grafting.

Professor Towar said he had heard recently in America progressive orchardists favouring a slope facing to the south, as it was said to yield more uniform temperatures.

Mr. Quinn explained that in most positions in this State the slope which faced any way towards the sun—say sweeping from east around to north and north-west—was most favoured, but the soil and rainfall played more important parts than position in selecting the site for an orchard.

Mr. Hargreaves ploughed about 9 inches deep before planting, and did not dig deep holes, although he had not noticed much disadvantage arising therefrom.

Mr. McLeod said in the south they usually avoided a western or southern slope, choosing to face the east to secure the morning sunshine.

Mr. Geo. Quinn addressed the meeting on

THE CODLIN MOTH TROUBLE.

He said it is recorded that this insect existed as a pest probably 200 years before the Christian era began, because in a treatise on Agriculture, Cato had written about "wormy fruits." In the first century of the Christian era Pliny also referred to the fruits being affected by "worms." Its modern history—which left no doubt respecting its identity with the present pest—began in a Dutch work written in 1635. In 1747 an English Entomologist named Wilkes gave the insect its vernacular name owing to its habit of infesting the early cooking or "Coddling apples." In 1825 Thatcher in the American Orchardist outlined its life history, and first suggested remedies for restricting the evil. This was practically 200 years after the Europeans first began to notice its depredations. This difference between the apathy of the European and the alertness of the American apple grower had not yet been completely bridged. As far as records go the pest was first noted in 1855 in Victoria, and in 1861 in Tasmania. During the year 1874 it is recorded from New Zealand, and it was first identified by the late Frazer Crawford in South Australian grown apples in 1885, about Christmas time. It most likely started here a season or two prior to that year. With one or two exceptions it was confined to the plains around Adelaide, during the first nine or 10 years after its introduction to this State. When he (the speaker) took charge of the work under the Vine, Fruit, and Vegetable Protection Act, in 1894, it could not be traced continuously throughout the gardens on the plains as far as Glen Osmond or Paradise. It had, however, taken a firm hold of the old orchards in the Torrens and Sturt Valleys.. These being market supplying orchards it gradually spread into the nearer hills, and so from year to year it had gone farther afield, until at the present time no district in which any quantity of apples were produced could claim absolute freedom from the pest. There were, however, many isolated orchards still free, but owing to the custom of indiscriminately interchanging fruit cases which prevailed here it was only a question of a few years until every apple orchard would be attacked. The possibilities for apple production in this State are very great, and the success of apple growing is so intimately bound up in this question, that no one interested should any longer shirk the individual responsibilities now attached to the suppression of the pest. The difficulty in the past had been to induce those who should know differently to take a serious view of the question. This disability had not yet been removed. There was hope, however, of a better state of things being realized as the matter was now being forced into discussion. He feared for the immediate result, as this, in common with other pressing reforms was in danger of being decided by a popular clamour, and not by that depth of foresight on which we pride ourselves. When those who were most materially interested awake to find themselves at a disadvantage, and in a false position, the inevitable reaction would then set in, and years of lost ground would have to be retraced with somewhat heavily laden feet. The battle for clean, high quality produce would begin anew, and the weary course of regaining a once worldwide fame for first class produce would have to be fought over again.

The law upon the subject was often blamed, and the authorities for either passing it, or not causing it to be enforced, just as the occasion appeared to demand. The unpalatable truth, however, remained that without the intelligent co-operation of those most interested the authorities could not make headway. Since the very outset of the difficulty the officers of the Department of Agriculture — and before such a department was organized —everything known respecting the habits and methods of combating the insect had been scattered far and wide in print as well as from the platform. Thousands of pamphlets have been distributed, and thousands of verbal explanations have been given by the inspectors to individual growers, but the unsavoury truth must be told that an equal response has not been forthcoming in the shape of a unanimous effort to deal with the pest in the orchards. It is true, exemplary instances are found, but it must be reluctantly admitted that the great majority have shown an apathy not worthy of intelligent men. In the more recently affected districts a somewhat rude awakening from fancied security has been experienced, and a somewhat feverish anxiety displayed to do all possible to rebut the evil. These districts will no doubt experience to the full the truth of the old adage, "Prevention is better than cure." Shut in as we are by markets hostile to codlin moth affected fruits, the profitable existence of the industry depends upon each individual rising to the occasion, and doing his own share of the repression. To soothe one's troubles with a desire to be allowed to foist off the insects upon the city purchaser of apples, or to follow the ostrich-like course of thinking the insects once sent out of the orchard are not likely to return, are childish methods of grappling with the difficulty. To go back to earlier experiences, we trace the spread of the pest to fruit boxes and packages witn which they have come into contact, and this retrospection must dispel at once any fancied relief anticipated in sending the insect away in the fruits. Besides, four-fifths of the caterpillars never go out of the orchard in the fruits, but quit them before the apples fall prematurely, or are harvested in a ripe condition. We are not likely to increase the consumption of apples by supplying damaged specimens polluted with the burrowings of a loathsome insect to our citizens.

During the season just past we have had some excellent samples of how the insect may be checked by spraying with arsenites, or by following up the system of bandaging and picking off the infested apples at frequent intervals. To overcome this difficulty we should take a leaf from the book of hard-earned experience gained by our fellow growers in Tasmania. We would then begin at the base of the evil, and start out to combat the pest in the designing of our trees. Newly planted trees should be kept small, and old lofty trees reduced to a manageable height so that all work can be done without resorting to step-ladders, or they should be cut right down, and regrafted. If the stems are decayed they should be grubbed out and burnt.

With trees formed thus, we could pull off infected fruits, or effectively spray the whole crop at a minimum cost. It is an absolute waste of energy to attempt to deal with this insect in lofty trees, covered with rough bark, or studded with decaying knotholes, or unhealed wounds of any kind. Such trees cannot be sprayed thoroughly, neither can the infested fruits be picked at a payable cost. The fruit stores also require attention in the direction of making them moth proof, so that insects hatched inside may be prevented from escaping to the orchard. The habits of the insect are now pretty well understood. The need for removing all natural shelter about the bark is more generally known than put into practice. He recommended them to spray the trees when the young fruits are set, using arsenite of soda and limewater, in the proportions and manner so frequently advocated in the Departmental Journal, but wished particularly to impress upon them the need of using perfectly fresh lime. If they used air slaked lime the arsenic instead of being of value in saving the fruits from the pest, would prove far more destructive to fruits and foliage than the Codlin Moth they were anxious to kill. In this climate where during each year several broods of the insect appeared, it was a waste of time to put bandages around the trees unless they were examined at least once in every ten days. If left much over this period the insects completed the intervening stages between caterpillar and moth, and the neglectful grower only provided a snug breeding place for the pest which was doing him so much injury. In conclusion he asked every one to view this subject as involving a personal obligation, and not until this were accomplished would the difficulty be overcome. The good results obtained by certain individuals could be obtained by the growers as a body, but it was not until each one took upon himself the determination to destroy all of his own homebred moths that this desirable result would be made possible.

Votes of thanks to the Chairman and Hon. Secretary of the local Bureau and to the speakers closed the proceedings of the Conference.

AGRICULTURAL BUREAU REPORTS.

Orroroo, August 22.

Present—Messrs. J. Scriven (chair), W. T. Brown, W. S. Lillecrapp, E. Copley, J. Jamieson, J. Moody, M. Oppermann, W. Robertson, and T. H. P. Tapscott (Hon. Secretary).

Pig Keeping.—The Chairman read a paper on this subject to the following effect:—

While there was a good deal in the statement that "the breed goes in at the mouth" there was always a great difference in the capabilities of the different animals. Some pigs will grow quickly and fatten easily, while it is almost impossible to fatten others. A good pig should weigh 200 lb. to 250 lb. at twelve months; he had had extra good animals that put on a pound per day with good feeding. He favoured the progeny of a pure-bred Berkshire boar and a good crossbred sow, fairly long and with good quarters. The crossbred sows, as a rule, are more prolific than the pure-bred; it did not pay to keep sows producing only five or six in a litter. They should not keep sows that will not produce and rear eight to ten pigs each time. The Poland-China pig was a good grower and fattened well, but he considered they produced an excess of fat for curing or for general use. The cross between the Berkshire and white Yorkshire often produced splendid pigs. The question of feeding was of the greatest importance. A comfortable sty and a good warm bed in winter will greatly assist to profitable growth. It is a mistake to think, as many do, that anything is good enough for the pig. When weaned the pigs should have warm food, particularly in cold weather. A little milk or slop mixed with pollard can be warmed in a bucket without much trouble, as they usually had plenty of fire in the winter; put the food on to warm while they were having their own breakfast. To be successful with pigs they must keep them growing all the time; if once checked through scarcity of food or neglect it meant time and food lost. Let the pigs have a run occasionally to stretch their limbs; this referred to pigs shut up for fattening. He did not know which was the best food for pigs, but he had found if they get plenty of pollard, peas, milk, or wheat, crushed or whole, they will do all right. Where green barley can be grown it is very useful for store pigs, but in the north the seasons were so precarious that farmers are almost confined to wheat and milk. When penned for fattening give the pigs as much food as they will eat; feed three times a day, and not too sloppy. It pays best to give them plenty, and fatten as quickly as possible.

Mr. Brown said a teaspoonful of saltpetre given occasionally in the food for boar pigs for fattening got rid of the rank flavour. Other members have adopted the usual plan of sticking and castrating them at the same time. The Hon. Secretary said he fed his pigs on milk and slops, with pollard and corn to fatten them. For two or three weeks before killing he gave them nothing but clean water and corn; if he could grow them he would sooner give them dry peas. The corn and water results in firmer and sweeter bacon.

Richman's Creek, August 19.

Present—Messrs. W. Freebairn (chair), A. Knauerhase, A. Nicholson, J. M. Kelly, J. J. Gebert, and J. McColl (Hon. Secretary).

Rainfall and Wheat Yields.—Mr. McColl read a very interesting paper showing details of rainfall and yields secured on the land farmed by his brother and himself since 1888. [Paper appears as separate article elsewhere in this issue.—Ed.] Mr. Knauerhase pointed out that Mr. McColl's figures could not be taken to apply to the district generally, as the rainfall was very variable, even within a limited area. On the plains the crops are very uncertain; for the past 10 years he had only reaped on an average four bushels per acre. Mr. McColl admitted that the rainfall in the district was very patchy; he had frequently noticed the lessened fall as the rain travelled across to the plains. Mr. Kelly stated that the patches of crop that were alive were running up already, and he thought it would be better to feed them down. Other members agreed.

Clarendon, August 11.

Present—Messrs. J. Piggott (chair), J. Spencer, A. A. Harper, J. Juers, J. Pelling, W. Spencer, H. W. Payne, E. Dunmill, W. A. Morphett, and J. Wright.

Botfly.—Short discussion on this subject took place, and was adjourned till next meeting to allow members to obtain more information about the matter.

Insect Pest.—Mr. Morphett tabled large grub found boring into plum and apricot trees. Members were afraid this was likely to do considerable damage unless carefully attended to.

Oranges.—Considerable discussion took place on best kinds of oranges for market, but no conclusion was arrived at.

Nantawarra, August 11.

Present—Messrs. J. Nicholls (chair), R. Nicholls, T. Dixon, jun., E. J. Herbert, A. F. Herbert, S. Sleep, J. W. Dall, R. Uppill, E. Pridham, A. L. Greenshields, and J. Spencer (Hon. Secretary).

Stock Complaints.—Mr. Nicholls reported that he had adopted the recommendation of the Chief Inspector of Stock as to the treatment of horse suffering from broken wind (see page 76, August issue of Journal of Agriculture), and the animal was apparently as well as ever. Members reported that several horses had been suffering from severe cold for about a week, accompanied by a small swelling in the neck, which afterwards breaks and the animal soon recovers. It was agreed that if it were strangles it was a very mild form and not contagious, as several cases had occurred where an affected horse had been running with young stock, which, however, escaped the trouble. Members had noted formerly that when strangles broke out it would go through the whole of the stock not previously affected, and the animals were bad for a long time.

Apprentices on the Farm.—Mr. Dall read an interesting paper on this subject, which was well discussed. Paper forwarded for annual congress.

Kingston, August 2.

Present—Most members, and about 60 visitors.

Field Trial.—Instead of the ordinary meeting of the branch, a public field trial of implements suitable for breaking up the hard flats of this district was held. The Farmers' Union sent a Spalding-Robbins disc plough and Climax disc harrows, and the Implement Company their Giant spring-tooth cultivator and also their Spading harrows. The work of the disc plough was very favourably commented on, the work done in the heavy patches of cutting grass being very satisfactory. Although it works the ground well to a good depth, the four horses pulled it steadily, four discs being in use. To show its value for making shallow drains, the machine was set to throw a 32-in. furrow, and on the return threw out another 32-in., making a furrow 64 in. wide. Those present thought it would be a very suitable implement for making shallow drains on the low-lying flats in this district, where slight banks prevent the escape of water. The disc cultivator also did satisfactory work. The Giant cultivator, with a width of 9 ft., was worked by two horses, and was given a severe test on a patch of ground never previously broken up. It stirred the soil to a depth of 6 in., and with a cross-working left it in splendid condition for sowing rape or similar crops for feeding purposes. The opinion was freely expressed that the implement would enable such crops and grasses to be sown very cheaply, and as this district was capable of producing first-class fat lambs if fodder is grown there should be a demand for it.

Woodside, July 21.

Present—Messrs. R. Caldwell (chair), A. Lorimer, R. P. Keddie, F. D. Heidrich, C. W. Fowler, W. Drogemuller, R. W. Kleinschmidt, W. Rabach, G. F. Lauterbach, and A. Hughes (Hon. Secretary).

Advantages of an Agricultural Life.—Mr. Caldwell read a long paper on this subject. He referred to the importance of the duty of making people contented with their lot, and of the necessity of supplying the ordinary man with the knowledge required to make the best of his circumstances. This was more particularly necessary in the case of the tillers of the soil. Such knowledge was essential to the attainment of the desired end—namely, contentment. He quoted various writers, from Virgil down to Burns and Tennyson, on the importance and glories of the agriculturists, all tending to show that the cultivation of the soil possessed pleasures and attractions beyond the reach of the mechanic or clerk. The advantages of rural life were, however, at all times in accord with the interest taken by the individual in outdoor work. Members were of opinion that Mr. Caldwell had painted his pictures in too rosy colours altogether, but suggested the paper should be published in The Journal, so that farming members of other branches might learn what a grand thing it was to be a farmer, and be thankful with their lot. [Unfortunately we are unable to print this paper. This we regret, as most farmers would be surprised to learn what fortunate people they are.—Ed.]

Gawler River, July 18.

Present—Messrs. H. Roediger (chair), J. Hillier, R. Badcock, E. Winckel, W. Clark, F. Roediger, C. Leak, and A. Bray (Hon. Secretary).

Selection of a Farm.—Mr. J. Hillier read a paper on this subject to the following effect:—

The selection of a farm, more or less improved, requires taste, judgment, and ability to estimate correctly the cost of those improvements which make a place desirable, as well as to estimate the natural advantages of the farm. Few farmers who have made improvements are able to tell what they have cost, and not many who buy really appreciate their value. A farm with broken fences and tumbledown buildings is worth less than a piece of new unbroken land, as it costs more in the end to patch up old things than it does to get the new ones. A good garden with windbreaks in proper places, a stream of water, and natural protection by hills are always to be taken into account. A farm may be unproductive on account of bad management, and yet fertility of the soil may not be injured. The first thing to be considered is the quality of the soil; the next is the situation; and the third is water. The soil can be judged by the vegetation growing on it. The proportion of plough and pasture land must be considered, though as a rule good wheat and hay-growing ground will be good pasture land. Always remember that good pasture is the success of good farming. The situation of a farm is not always considered by farmers as of great value, but a good building site is often worth half the value of a farm. It should be high enough up so as to be always well drained and clean, and yet easy of access. Even the largest farms should not have their buildings more than a quarter of a mile from the road, and, if possible, the whole farm should be within view of the housetop. Never buy a farm with costly improvements if they are not suitable to your wants, unless the price is so low that you can afford to alter and reconstruct. A rundown farm, if the soil is good, is the place to improve to your liking. A high-dry farm is not suitable for grass, neither is moist, cold land, subject to every sweep of the wind, suitable for fruitgrowing. Do not buy a rocky, hilly, or stumpy farm unless pasturage is your object, and then the price should be low. For stock the moderately level land is always best. Do not go in for too much land. The necessary repairs must be made, implements bought, and the farm must be stocked and a proper sum reserved for working capital. Farming is not the drudgery it was fifty years ago. The comfort and improvements in harvesting machinery are by no means to be overlooked. The man with twelve or fifteen hundred pounds or more of capital, especially if he has a growing family going to school, may do far better by investing the money in an improved or partly improved farm near schools, markets, and society rather than isolate them by going to the far north and buying poor land. It is not advisable for a man who has money enough to stock a farm, however moderately, to lease. If, however, the advantages offered by schools, markets, &c., make leasing desirable, nothing should be left to chance—everything should be in black and white, and so plainly stated in the lease that there can be no room for dispute. Some leases are so carefully drawn that the quantity of manure per acre to be used yearly is a condition, and also what particular crops are to be grown. Even the rotation of crops, where the rainfall is suitable, is often stipulated. The object both of the tenant and the landlord is to get as good terms as possible for himself. In making a contract of whatever kind avoid all unnecessary words, and be sure that the meaning is clear.

Soursops.—Mr. Bray stated that last year, on land badly infested by soursops (Oxalis cernua), he grew peas, and on the strips between the rows where he used the horsehoe there were this season very few plants of soursops. Mr. Leake had cleared a piece of infested land by wirenetting it and turning young pigs in. Another member mentioned that he had seen a piece of land cleared by ploughing deeply and then running poultry on it. Members were agreed that while constant cultivation would thin out the soursops, it would not entirely clear the land.

Phenomenal Growth.—The Chairman tabled a bunch of wheat containing 25 well developed heads grown from a chance plant in his garden. There were second and third plants of 22 heads and 26 heads respectively out in ear, and others coming on.

Strathalbyn, August 11.

Present—Messrs M. Rankine (chair), P. McAnaney, G. Sissons, G. J. Read, T. Michelmore, A. Rankine, W. M. Rankine, H. H. Butler, and J. Cheriton (Hon. Secretary).

Ticks and Lice in Sheep.—Mr. W. M. Rankine read a paper on this subject to the following effect:—

The loss caused to sheepowners owing to the presence of tick and louse is greater than many imagine, for few flocks in the southern districts are free from them unless dipped regularly. The injury done to the wool is enormous, as against the cost of dipping, which need not exceed one penny per head on small flocks and half that on large ones; and it will be seen, therefore, that the neglect of dipping as an ordinary precaution against losses by tick and lice is an expensive piece of bad management. If sheep are observed rubbing against fences, stumps of trees, &c., or have the habit of biting and nibbling at their fleeces, there is good reason to believe they are affected with either ticks or lice, or possibly both. The wool on those parts of the skin which have been attacked by lice becomes dry, harsh, and stunted in growth. The losses arise from —1 The abstraction of the skin fats upon which the wool ought to be fed. 2. The injury to the fibre of the wool owing to the presence of the eggs of the tick, and the sticky substance which is secreted by the female. 3. The actual tearing away of the wool by biting and nibbling at the fleece, and by rubbing against fences, logs, &c. 4. Sheep not thriving as they ought whilst tormented by these parasites. 5. And the death of the sheep by getting on its back in hollows (more especially crossbreds) when rolling, unless assisted to its feet. So to kill these parasites should be the main object of every sheepowner, and in most instances one dipping will be found sufficient for the year. All sheepowners will know the sheep tick by sight, but very few know, or have seen the sheep louse, which is so very small as to almost require a glass, or to be seen in a very good light. The tick is much more fitted than the louse for leading an independent existence and for passing from one sheep to another. Some writers say for weeks and even months it may exist in sandy soils or underneath pieces of bark, locks of wool, &c., without even coming in contact with the sheep. But once it has done so it fixes its proboscis in the skin and hangs on with the greatest tenacity. The sheep louse breeds far more quickly than the tick: it has a red head, and a very large abdomen, marked transversely, the four legs are small and quite unfitted to enable the creature to exist long apart from the sheep. Sheep dips for killing these parasites may be classed as poisonous and non-poisonous. I prefer the poisonous, though I believe the non-poisonous will kill, not by poison, but by closing up the tiny holes through which the insect breathes, thus causing suffocation. The plans which have been put forward for sheep dipping baths and draining yards are many and various. I prefer the V-shaped bath with rounded corners., and a gate to prevent the sheep from going through too quickly, and think the best time to dip is a week to a fortnight after shearing, when the weather is dry and not too hot. For some hours before dipping it is best that the sheep should be kept in a yard, so that they may get rid of any droppings which may pollute the bath, and to avoid the danger of hurting the sheep by putting them through the yards and dipping them with full stomach. Besides, by keeping the sheep quiet for some time before immersion in the cold bath there is less danger of ill-effects from being overheated from special exertions due to travelling and yarding, although after a few sheep have gone through the water becomes warmer. And again sheep should not be thirsty when being dipped, otherwise there may be danger of them drinking. There appears to be no danger in repeatedly pushing the sheep under while in the dip, for last season I dipped between 4,000 and 5,000 sheep for 17 different owners without a single loss. If there are ewes and lambs to be dipped, draft them, and put the ewes through first so that they may have some time to dry before the lambs get to their mothers. Sheep should not be turned out to grass until water has ceased to drip from them. Whatever dip sheepowners prefer to use they should give it a fair trial by strictly carrying out any and all instructions (especially the time to keep the sheep in the dip) of the manufacturers. It behoves all sheepowners to look well to the state of their flocks and herds, for I am sure it pays handsomely to keep our sheep in such a state as will ensure the best results; and that cannot be when affected with these parasites—tick and lice. If we don't the Philistines may be upon us in the shape of the Stock Inspectors, who have power to enforce the regulations under the Stock Diseases Act of 1888, which are in brief:—Sec. 71. Sheep infected with tick or lice must be dressed. 72. All sheep in a flock are deemed infected if one or more are found with tick or lice. 73. Inspectors may give notice to dip if satisfied that one sheep is infected. 74. Owner not to allow infected sheep to stray, or stay on public road, &c. 75. Owner not allowed to remove infected sheep without permission of Stock Inspector. 76. Owner not allowed to expose for sale infected stock at a market, public or private. Part VII., Sec 87. Penalty not less than £5 or more than £100, or not more than twelve months with or without hard labour

Considerable discussion ensued, and it was agreed that it was necessary to dip sheep to preserve the wool from injury; also that it was a positive gain to the sheepowner, as his stock will thrive better and produce more valuable wool when kept free from parasites.

Wilson, July 19.

Present Messrs. W. H. Neal (chair), H. Need, H. Ward, D. Sexton, J. Nelson, A. Crossman, H. T. Crossman, W. H. Neal, Jun., A. Smith (Hon. Secretary), and two visitors.

Best Wheats for Hay.—Discussion took place on this subject. Several varieties were suggested, but the majority preferred Purple Straw, Bearded being next in favour. The latter was objected to by several members, as the beard was bad in the chaff.

Cabbage Aphis.—Mr. Ward said he found strong soapsuds effectual in destroying "blight" on cabbages. Mr. H. T. Crossman used insectibane for the same purpose with success.

Clare, August 8.

Present—Messrs. W. Kelly (chair), J. Christison, S. C. Bray, J. Treleaven, H. Carter, R. Martin, H. Adams, E. J. McCarthy, C. Horsman, J. T. Hague, A. P. Birks, W. S. Birks (Hon. Secretary), and four visitors.

Grafting Vines.—Mr. A. P. Birks read a paper on this subject to the following effect:—

The splendid returns from currant vines particularly in this district have given the industry a great impetus, and planting is being pushed on with by many growers, but I think that grafting for those who already have vineyards in bearing offers greater advantages. First, plots may be selected where it has been proved that vines do well. Secondly, it will only take two years to bring vines into currant bearing; and, thirdly, a good price is likely to be maintained for a few years at any rate, while those who plant will have to wait for about eight years for returns,. by which time currants may not be so profitable as at present. [It is probable that the practice of early ringing will bring currants sooner into bearing. —Ed.] As most of our vineyards are about the same average I shall deal with grafting vines from the age of say eight years and over. Vines undoubtedly bear better crops of grapes when grafted than they do on their own stocks, and regarding the naturally shy bearers it is a question well worth considering whether they should not always be grafted. Of all stocks the Mataro comes first, as it is a remarkably vigorous vine, and will do well where other vines might not. The grain of its stem is perfectly straight, and splits as clean as a piece of deal, and hence the operation of grafting is made much easier. I know that Carbenet, Malbec, Shiraz, and the Zante currants do well on this stock, but with regard to other varieties we should get information from those who can speak from experience, as it is quite possible to make a most unfortunate union. In my own vineyard I have an instance of this among Malbec scions that I procured for grafting on to

Mataro. I unfortunately got several Black Portugal. This union I have found to be utterly barren. On those that did set a few bunches of the grapes shrivelled right up long before picking the Malbec, which is an early grape, and which did remarkably well on this stock. [This may not be due to defective union, which generally has an opposite effect; Black Portugal frequently set badly on their own roots.—Ed.] Those who contemplate grafting vines of the wine varieties with currants should select places where the soil is best and where the vines are doing well, as experience proves that no soil is too rich for the currant, and which it seems to me requires the best of everything. Nearly all our vineyards are planted 10 feet by 10 feet, and I would suggest that every other vine be grafted on account of the following reasons:—First, on soil such as I have suggested for grafting, 10 feet is much too close for the currant, which if given a run of 20 feet would do infinitely better than with two vines with a 10 feet run. Second, the vines (that is every other one not grafted) will return one more crop of grapes, and a heavier one in all probability on account of the adjoining vines being cut down. [This is unlikely as the roots remain.—Ed.] Third, should from any reason, the grafting be only partially successful, we have the vines that are left to operate upon the following year. Granted that the take is good the vines between those grafted would be grubbed out the succeeding year. In the event of a graft not taking, if the stock throws up water shoots it can be grafted again the following year. If it does not, then the blank must be filled up by layering a shoot from the next vine which in a trellis is the simplest thing in the world, and an absolute certainty in result. The first operation in grafting begins at pruning time. Cuttings should be taken from vines which have been noted for their heavy bearing, and care should be taken that the wood is thoroughly ripened, hence it would seem that these vines should not be amongst those first pruned. The cuttings from which the scions are afterwards to be taken should be buried in rows in damp, but not wet, sand. If there is too much moisture difficulty will be experienced in keeping them sufficiently backward, and if there is not enough moisture they may die. A place, to be suitable for keeping the cuttings, should be cold, dark, and dry, and it would be desirable to examine some of them from time to time to see that they do not become too dry. Vines to be grafted may remain unpruned, but in the case of them being late in budding it would be better to give them a rough pruning to encourage earlier growth. [There is no advantage in leaving unpruned vines that are to be grafted; they only interfere with winter tillage.—Ed.] They will then be out of the way and will not interfere with cultivating. Grafting should not commence until the vines are just coming into leaf, and the sap will then be flowing sufficiently to ensure an immediate union between stock and scion. From the above it would seem that the first week in October should see grafting started and finished if possible. [You can start grafting in September in most districts.—Ed.] The cuttings may now be taken from the sand in small quantities as they are required, as if the weather should be too warm they must be kept from sun and air as much as possible, and while grafting, keep them wrapped in a piece of heavy bagging or anything else suitable, and taken from cover one by one as they are required. From the stem of the vine to be grafted hoe away the soil to a depth of about six inches. This will most probably expose some of the main roots. Shallow grafting is advocated by many whose authority we cannot ignore, but I prefer to be guided in this question by my own experience. I believe in grafting deep, for then we know that under any circumstances the scion will be kept moist. From one to one and a half inches from the surface soil would, in my opinion, be the proper depth, although of course there must be fully an inch and a half of the stem of the vine above the main roots to split. The vine should be sawn off with a short handy saw, and cut as straight as possible, then with a strong-bladed knife split the stock exactly in the middle. In the event of it being unshapely select the sides that present the most perfectly rounded surface Then withdraw the knife, and with a small mallet gently hammer in a wooden wedge sufficiently narrow to allow of both scions being placed one on either side of it; in case the stem of the vine is not large enough for two scions, the one put in must be cut in the form of a double wedge; if two scions are placed, in the form of a single wedge: [Like the blade of a knife.—Ed.] In cutting the scion from the cutting observe whether some of the buds (if perfect) are more backward than the others and select them. I have sometimes noticed that at the top and bottom of the cutting the buds have burst, while in the middle they are much more backward. Hence the advantage of putting away long cuttings instead of short ones. The scion should carry two buds. The cutting of the perfect wedge is not as easy as it looks, and it behoves any good grafter to practice this beforehand. Before inserting the scion clean off the rough outer bark of the stem of the vine Then see that the wedge of the scion touches the edges of the split in the stock to the full length of the insertion. The bark of the scion being considerably thinner than the inner bark of the stock, its edges must come into contact with the inner edge of the inner bark of the stock, and not the outer, as the exact spot where the union will take place is the line between the inner edge of the bark and the wood. The wedge should be cut so that when inserted the lower bud will be level with the top of the stock. It is most necessary that the knife for cutting the wedge of the scion should have a good, keen edge. It on account of the stock splitting badly, that is not straight, it is a good plan to slightly tilt the scion so that there will be contact between bark edges at one point at least. carefully withdraw the wedge, being careful not to touch the scions in doing so Then tie the top of the stock firmly with binder twine as this will rot away soon after the union is effected. [Unfortunatly in dry districts and dry seasons this is not always the case; raphia fibre is better.—Ed.] Now fill up the hole, in doing so burying the scions with finely pulverised soil, which should be lightly sprinkled in; the top bud of the scion should then be just barely covered. Then drive in a stake as close to the graft as possible, without running any danger of touching it. If the vines grafted are trellised, any straight, thin wattle stick will do, as it may be tied at the top to the wire to support it. Early in the summer examine all grafts, removing all earth from them, and if the graft has taken, pull off any suckers that may be coming up from under the graft, and remove any roots that the scion may be making. As the shoots from the graft rapidly grow, tie them up to the stake, being very careful not to break them. This brings the subject of my paper to an end, and I hope that it may prove of some use to those who intend grafting, possibly for the first time.

Maitland, August 2.

Present—Messrs. T. Bowman (chair), A. Jarrett, H. R. Wundersitz, C. F. Heinrich, J. Hill, W. Bowey (Hon. Secretary), and one visitor.

Yellow Patches in Wheat Crops.—Mr. Hill noticed the wheat was yellowing in a number of patches, and as these patches were more numerous since they commenced using manures he wondered whether it was likely that the manure caused too rapid growth, with the result that the wheat was affected by frost. Members thought the yellowing was the result of the severe frost experienced, and that with the warm weather the crop would recover.

Membership.—The establishment of some form of honorary membership was considered advisable as a means of helping to make the branches a success.

Gardening on the Farm.—Mr. Jarrett initiated a discussion on this subject. He regretted to see so many farmers taking no interest in the growing of vegetables for the house. Some were placed at a disadvantage in this respect, but many lacked the necessary care. A small area was all that was needed, and there was no doubt the farmers did not consume nearly as much in the way of green vegetables as they should. The expense attached to the garden was small. A suitable spot, convenient to the house if possible, should be well fenced. The ground should be well dug prior to planting, and given as much manure as possible. Do not plant things too close together. Time of sowing was of importance; often the work was started late. Sow early and have plants ready to set out when the rains come. The land should be kept in good heart, and should be feely cultivated to prevent the evaporation of moisture. Cabbages and cauliflowers could be grown with success; potatoes of late had been a failure with him; rape was very profitable to grow. Mr. Wundersitz said for vegetables they should use well-rotted manure of good quality. Refuse manure was of little value, and fresh manure unsuitable to this locality. The earlier they could set out cauliflower and cabbage plants the better. It might be necessary to put a shade on the north side when they are small. Rape made a splendid early substitute for the usual vegetables, and should be grown by all farmers. Other members agreed that the garden, well attended to, helped to make the home attractive, besides being profitable and educational.

Stockport, July 21.

Present—Messrs. F. Watts (chair), D. G. Stribling, J. F. Godfree, G. Thomas, T. Megaw, A. Branson, C. Hartnell, and J. Murray (Hon. Secretary).

Coltbreaking.—Considerable discussion on this subject took place, and it was generally agreed that the colt should be handled kindly and plenty of time taken in breaking him in.

Murray Bridge, July 18.

Present—Mr. R. Edwards (chair), several members, and visitors.

Intense Culture and Irrigation.—Members accepted invitation to pay a visit to the swamps near Wood's Point Landing, reclaimed by Messrs. J. and A. Morphett. Members made the trip from Murray Bridge in a launch, and on their way had a good view of several large swamps stretching away back from the river banks, and in the light of what they saw afterwards were convinced that if reclaimed they possess possibilities of wealth untold. At Wood's Point members were met by Messrs. Morphett and shown round the place, the embankments made to reclaim the swamp land and the methods of irrigation receiving special attention. The embankment is 9 feet 9 in. above present water level, and is calculated to keep out all but exceptionally high floods. The area reclaimed is over 600 acres in extent. A paddock of lucerne from which four cuts had been taken within nine months of seeding was inspected. Onions nearly ready for planting out were growing in beds; last season up to 30 tons per acre of onions were harvested. Mr. Morphett mentioned various particulars of crops harvested, the figures surprising most of the members. The visitors were entertained at dinner, and after thanking Mr. Morphett for his hospitality, they congratulated him on the success the firm had attained in their enterprise. Mr. Morphett stated that he was pleased to be able to give them information concerning the utilisation of the swamps and invited members to pay him another visit in November, when the crops are to be seen to advantage.

Golden Grove, July 17.

Present—Messrs. R. Smith (chair), S. A. Milne, T. G. McPharlin, A. Harper, W. Mountstephen, F. Buder, C. Angove, and J. R. Coles (Hon. Secretary).

Farming in South Australia.—Mr. Coles said from papers by members of branches on the subject of farming, and also from the general conversation of farmers one was compelled to the conclusion that the tiller of the soil did not get a fair reward for his labour. Seeing that agriculture was the mainstay of the world, and that South Australia was so dependent upon the products of the soil for her prosperity, he thought the following points worthy of discussion:—(1) The cause of the present state of affairs and suggestions for improvement; (2) which is the best line of farming to adopt; (3) was it better to become a specialist in one branch or to have several irons in the fire; and (4) does a small farm pay better than a large one. A good discussion took place. It was agreed that the size of a farm should depend upon the amount of capital at the disposal of the farmer. A frequent mistake was to try to work too large an area. The farmer should try to produce something of everything saleable that can profitably be grown in his locality. Hay and wheatgrowing were almost necessarily associated with stockraising. Sheep were particularly valuable, bringing in a quick return and helping to clean the land. Apart from initial cost of fencing they cost less than large cattle. Dairy cows properly looked after were a good source of income. Pigs and poultry must not be neglected. The farmer who keeps all his eggs in one basket must expect some rough knocks. Bare fallow is condemned in this district. When first broken sow rape and feed it down; next season crop with wheat and again put in a crop of rape, each being well manured.

Mylor, July 21.

Present—Messrs. W. Nicholls (chair), J. Smith, W. H. Hughes, E. J. Oinn, T. J. Mundy, F. G. Wilson, W. J. Narroway, T. G. Oinn, W. Bradley, J. Nicholls, P. P. Probert, W. G. Clough (Hon. Secretary), and three visitors.

Mangolds.—In reply to questions it was agreed that the best time to sow mangolds in this district was July or August. [Sixteen present at this meeting, and nothing but this report. Surely there is room for improvement.—Ed.]

Colton, August 2.

Present—Messrs. P. P. Kenny (chair), M. S. W. Kenny, E. H. Whitehead, H A. Kleeman, J. H. McCracken, W. J. Packer, W. A. Barnes, and R. Hull (Hon. Secretary).

Manures.—Mr. Packer reported on the condition of the crops on his experimental plots. At present the plots manured with complete manure and with 130 lb. super per acre looked the best.

Standard Sample of Wheat.—This subject was again discussed, members being all agreed that the present system of fixing the standard and the treatment meted out by the wheatbuyers was not satisfactory to farmers. Members also believed that if wheat was sold in bulk it would be cleaned better, and generally a better sample would be produced. It was also agreed that the present system of testing the weight of wheat was unsatisfactory, members being of opinion that the weight should be tested from a full imperial bushel measure. Members were also of opinion that the Corn Trade Section of the Chamber of Commerce should endeavour to fix the standard earlier in the season, and also should encourage farmers to clean their wheat better. At present there was no inducement to do this, as so long as the wheat would reach the standard the more chaff, &c., that they could leave in it the better for the farmer. Until the wheatbuyers took the matter in hand and said—"We will give ½d. per bushel more for each pound over the standard weight and dock 1d. per bushel for each pound under," there was not likely to be any improvement.

Meadows, July 19.

Present—Messrs. W. Pearson (chair), J. Catt, G. Ellis, W. Nicolle, T. B. Brooks, G. Rice, D. D. Murphy (Hon. Secretary), and several visitors.

Sheep and Wool.—Mr. Geo. Jeffrey gave an interesting address on this subject. He thought large framed merino sheep most suitable for farmers in this district: sheep with large frames, wool of good length and moderately strong in fibre. The fat lamb trade should pay well here. The Shropshire ram crossed with merino ewes of large frame was recommended. Plenty of feed was essential to success in this branch. Matters in connection with shearing and wool classing were dealt with. Skins should be kept in a clean place and properly treated. Sheep in conjunction with agriculture and wattle growing will pay well in this locality, but attention must be given to details connected with their management.

Eudunda, July 21.

Present—Messrs. J. von Bertouch (chair), H. Martin, F. W. Paech, M.P., H. D. Weil, J. A. Pfitzner, R. Kluske, F. H. Walter, W. H. Sieber, W. J. Krummel, and W. H. Marshall (Hon. Secretary).

Seeding.—The question was asked—Have members noticed that wheat drilled in with furrows running across the direction of the prevailing wind does better in the early stages of growth than if sown with the furrows running in the direction of the wind? Members answered the question in the affirmative, and expressed the opinion that the ridges sheltered the young plant from the wind. They would like to know whether the same thing had been noticed in other districts.

Feeding Off Wheat Crop.—Mr. Sieber stated that as one of his fields of wheat came up very irregular he put on sheep to feed it down, leaving them until the field looked quite bare. The result was a splendid crop.

Selling of Eggs and Poultry.—The Hon. Secretary suggested that with a view to encouraging poultry farmers to improve and to increase the size of both eggs and poultry, it was desirable that these products should be sold by weight. All present agreed with the suggestion, and invite the opinion of members of other branches.

Bute, July 15.

Present—Messrs. J. H. Brideson (chair), W. H. Sharman, E. Ebsary, A. Cousins, A. Schroeter, M. Stevens, D. McEvoy, H. Schroeter, R. Commons, S. Trengove, W. A. Hamdorf, F. Gitsham, A. Sharman (Hon. Secretary) and two visitors.

Harvesting Wheatcrops.—Mr. S. Trengove read a paper on "Which is the Best Means of Harvesting?" He furnished the following estimates of cost of harvesting by three different methods, taking a crop 3 feet high, going 16 bushels per acre:—

THE STRIPPER.

	s.	d.
Stripping	3	0
Cleaning 4 bags wheat	1	8
Cost per acre	4	8

THE COMPLETE HARVESTER.

	s.	d.
Stripping	3	6
Sowing bags	0	4
Cost per acre	3	10

THE BINDER AND HEADER.

	s.	d.
Cutting and twine	4	6
Stooking	0	5
Carting and stacking	3	6
Heading and restacking	3	6
Cleaning	2	0
Cost per acre	13	11

The extra cost of the binder and header system was therefore 9/ to 10/ per acre. Against this expense the farmer had say one ton of good straw, much superior to straw from a stripped crop; the wheat from the crop cut with the binder weighed heavier, and there was less loss from shaking out. Besides this, work could be commenced twelve days earlier, and this meant less risk of loss from storms and fire. After trying the system side by side with the stripper for four years, and with the complete harvester for two years, he had no hesitation in saying the most profitable way of harvesting was to cut the crop with the binder and head it.

Lipson, July 19.

Present - Messrs. S. F. Potter (chair), W. F. Darling, Chas. Provis, E. Thorpe, J. McCallum, Geo. Carr, Geo. Baillie, Jas. Brown, E. J. Barraud (Hon. Secretary), and four visitors.

Ants.—Mr. Baillie had much trouble with a small black ant about a quarter of an inch long, which damaged the vines, fruit trees, and shrubs. He had tried various means of getting rid of them, but without success, and would like to know how to deal with them. [As the methods already tried are not stated it is difficult to advise treatment. If the nests can be found fumigating with bisulphide of carbon or sprinkling with London Purple will probably be effective. The latter poison dusted along the tracks will destroy many of the ants.—Ed.]

Potatoes.—Mr. Provis wished to know whether it was advisable to plant freshly dug seed potatoes, or should they be exposed to the air for a time. Mr. George Carr advised starting the seed before planting. Both advised planting cut sets from large potatoes in preference to small seed potatoes.

Pickling Seed.—Mr. Brown asked if pickled oats could be safely fed to stock. Members thought there would be no danger. [It will depend upon the pickle. If bluestone, there would be a danger.—Ed.]

Bowhill, August 2.

Present—Messrs. N. P. Norman (chair), W. Towill, S. Johnson, J. Waters, E. P. Weyland, H. F. Baker, J. McGlashan, J. G. Whitfield (Hon. Secretary), and two visitors.

Manures.—Mr. Towill had dressed some very strong land with mineral super at the rate of 60 lb. per acre, also drilled some seed in without manure. Where manure had been applied the wheat looked very well, but on the unmanured land it was poor. Mr. W. Tyler, jun., stated that he had sown wheat broadcast on very stony land, applying 50 lb. super per acre, and he was satisfied that on such land wheat can be grown with the aid of manure.

Cradock, July 19.

Present—Messrs. R. Ruddock (chair), A. N. Graham, J. Turner, J. Paterson, W. J. Glasson, T. Marsh, W. Haggerty, P. Gillick, J. H. Lindo (Hon. Secretary), and one visitor.

Farming in Western Australia.—Mr. Paterson stated that he had heard on very good authority that some of our farmers who had gone to the Western State were greatly disappointed with the results from wheatgrowing.

Horse Complaint.—Mr. Paterson reported mare of his was suffering from a running wound on the underpart of the belly a little towards the left side. A small swelling first appeared, which later developed into a wound which had been discharging for four or five months. The mare kept in fair condition, and continued to work. Other members had known of similar cases, and they believed the trouble due to rupture.

Season.—Members reported that the present season was the worst experienced since 1897. What wheat came up after the June rains has quite disappeared.

Arden Vale, July 21.

Present—Messrs. E. H. Warren (chair), M. Eckert, C. Pearce, A. W. Fricker, F. Schutloffel, G. Miller, W. Williss, A. Hannemann (Hon. Secretary), and four visitors.

General Secretary.—The following resolution was carried unanimously:—"The members of this branch bid farewell to Mr. Molineux with feelings of regret, and recognise that his services to the agricultural community have not been surpassed. The General Secretary has been a consistent supporter of the farmers' cause at all times, and no 'vested' interest has ever induced him to waver in his support. As the organiser of the Bureau he conferred a benefit on the farming community which is being more and more appreciated, and as editor of Journal he has been a conspicuous success. The members of this branch wish him 'God speed.'"

Annual Report. Five meetings held, with average attendance of seven members. Two papers read and various matters of practical interest discussed. The continuance of bad seasons has interfered with the work of the branch. Messrs. E. H. Warren, M. Eckert, and A. Hannemann were re-elected Chairman, Vice-Chairman, and Hon. Secretary respectively.

Takeall.—Mr. Eckert initiated a discussion on this subject. He had had a lot of trouble with it and found that it was more prevalent in land which was worked in a dry state than when it was wet; that "Bay of Biscay" and other heavy land was mostly affected, but it would appear on any land. Mr. Schutloffel gave a long and interesting account of his experience with the disease. He thought that the want of nitrogen was the principal cause, although there may be several other causes besides this, viz., wrong cultivation, and too much water in crabhole country. Mr. Fricker had observed that the patches affected are always loose like ashes, and that it was worst in good seasons; he did not think impoverishment of the land was the cause.

Rainmaking.—The Chairman read account of reported successful efforts in Japan to cause the rain to fall by means of electricity.

Gladstone, August 2.

Present—Messrs. J. Milne (chair), W. A. Warnum, J. Rundle, J. Sargent, G. M. Growden, and C. Goode (Hon. Secretary).

Annual Report—Nine meetings held during the year, with an average attendance of eight members. Various subjects of practical interest had been discussed, but the year's work had been far from satisfactory.

Work of Branch.—A discussion took place on the advisableness of closing the branch. It was resolved, however, to make a strong effort to carry on with better success than in the past. It was also decided that meetings be held on the Saturday evening nearest full moon to enable farmers' sons and others who cannot attend day meetings to become members; that it was advisable that no limit should be placed on the membership of the branches; and that the cost of The Journal of Agriculture should be borne by the members; that notification to each member of dates of meetings should cease, and in lieu thereof a programme of meetings and subjects be supplied to each member; also that more experimental work should be undertaken by the branch.

Boothby, July 22.

Present—Messrs. J. T. Whyte (chair), E. Bradley, J. Bell, R. Chaplin, D. Sims, A. T. Henderson, R. Carn (Hon. Secretary), and one visitor.

Experiments with Fertilizers.—Mr. Sims reported on some experiments he had carried out. He applied from 60 lb. to 200 lb. of super per acre to different plots, with the result that the maximum amount of manure gave the most wheat and fully twice as much straw as the lighter dressing. All the plots were badly rusted. He also tried an experiment in topdressing the crop when the wheat was about 3 in. high, the manure being broadcasted over the land. The crop was first class and free from rust.

Meningie, August 4.

Present—Messrs. M. Linn (chair), F. Ayers, T. Joy, W. Wilks, A. J. Myren, T. W. R. Hiscock, W. J. Botten, Jabez Williams, C. J. Shipway, and H. B. Hacket (Hon. Secretary).

Exhibit.—Mr. Hiscock tabled sample of grass which he had noticed to be spreading in his paddocks during the past year. Members thought it was probably Johnson Grass. Mr. Hiscock also tabled cyst about the size of a large duck egg, taken from off the ribs between the skin and the flesh of a rabbit. He had destroyed several rabbits on which he found similar growths. Members thought this was hydatids.

Experimental Plot.—Mr. Joy moved—"That the branch advocate the establishment of an experimental plot in the district." Members were opposed to the proposal, but thought the State would benefit from the establishment of such a plot in the so-called desert, where there was so much land belonging to the State. If the work on the plot demonstrated that this land could be profitably utilized, the money would have been well spent.

Visit by Officers of Department of Agriculture.—It was decided to ask that one of the officers attached to the department should visit the district and give an address on dairying or pastoral pursuits.

Manures.—Mr. Tiller initiated a discussion on the use of the seed and fertilizer drill. Discussion was adjourned till next meeting.

Pig Complaint.—Mr. Myren asked whether members had experienced any trouble with their sows when farrowing. One of his neighbours had a sow so bad—the womb and young having come down—that he had to destroy her. He would like to know what was the cause, and if there was any remedy. He thought possibly overfeeding just near time of farrowing might have brought about the trouble. Mr. Hiscock said he had experienced similar trouble, and thought overfeeding the cause.

Johnsburg, July 19.

Present—Messrs. T. Potter (chair), G. H. Dunn, M. E. Redden, W. Buchanan, J. Luckraft, F. W. Hombsch, L. Chalmers, and T. Johnson (Hon. Secretary).

Salt for Stock.—The Hon. Secretary read an article from July issue of Journal of Agriculture on this subject and a discussion ensued. The Chairman found his horses much improved in health and appearance since he had given them salt in their feed. Animals should be allowed free access to salt, place rock salt in convenient receptacles for them. Mr. Hombsch found horses did not care about rock salt; it was generally too hard, and too much exertion was required on the animal's part to secure sufficient salt. He had noticed that when his horses were paddocked in the South they kept low in condition, although not short of feed, and he put this down to want of salt. Mr. Dunn could not get his horses to take the rock salt, so he gave them ordinary salt mixed with the feed to their decided benefit. He had also given liberal quantities of salt to a filly recovering from strangles and found this treatment very successful. Mr. Luckcraft gave his horses salt freely, although they received well water supposed to contain a fair amount of salt, and he found they benefited considerably from it. Other members also stated that they found salt in the feed very useful.

Horses with Bad Coats.—Mr. Dunn recommended ten drops of arsenicum tincture for horses with bad coats, giving it on the tongue. This was a splendid tonic and blood purifier.

Paskeville, July 26.

Present—Messrs. A. Goodall (chair), H. F. Koch, T. H. Price, A. C. Wehr, J. P. Pontifex, G. Meier, S. R. Price, J. C. Price, W. S. O'Grady (Hon. Secretary), and several visitors.

Underground Grubs.—Several members reported this pest to be making its presence felt in both crops and grass.

Wheat Standard.—After discussion it was resolved that it be suggested for discussion at the Annual Congress the advisableness of dividing the State into two or three districts according to climate and season for the purpose of fixing the F.A.Q. standard as soon as the crop was mature.

Arthurton, July 24.

Present—Messrs. W. H. Hawke (chair), W. Short, T. B. Wicks, J. B. Rowe, L. Crosby, J. Welch, C. L. Palm (Hon Secretary), and a number of visitors.

Homestead Meeting.—This meeting was held at residence of Mr. L. Crosby. A visit of inspection was paid to the farm buildings, and special attention was given to a 6½ horsepower oil engine working a Martin & Co. No. 5 chaffcutter. Members expressed their appreciation of the work done by these engines and complimented Mr. Crosby on his enterprise.

Officers.—The Chairman and Hon. Secretary were thanked for their services and re-elected for ensuing year. Mr. Welch read a paper on "Cost of Working a 1,000-acre Farm." After some discussion it was decided to consider the paper at next meeting.

Yankalilla, August 1.

Present—Messrs. E. C. Kelly (chair), J. Tonkin, H. Leverington, J. Crawford, G. Newbold, A. Mayfield, Dr. Meickle, Messrs. J. Gardner, J. Grundy, H. J. Dennis, and G. H. MacMillan (Hon. Secretary).

Work of Branch.—This meeting was specially called to consider the position of the Branch, considerable difficulty having been experienced for some time in getting a quorum. After considerable discussion, it was decided that the Branch should continue, and that members make fresh efforts to make them a success. Suggestion made by Mr. Crawford that members take it in turn, in alphabetical order, to introduce a subject for discussion was adopted, Mr. Crawford agreeing to read paper at next meeting on "Cattle Feeding."

Ardrossan, July 19.

Present—Messrs. Freeman (chair), C. Cane, C. Dinham, D. Wilson, J. Henderson, W. Lodge, S. Alderman, R. Dinham, and N. Opie (Hon. Secretary).

Sheep.—Mr. Cane read a paper on this subject.

To the farmer who owns from 600 acres and upwards, the keeping of a few sheep may be looked upon as almost a necessity. They assist materially to clean the land, supply him with meat, and if he is careful not to overstock he can often dispose of his surplus at a time of the year when high prices rule. Too much stress cannot be laid upon the evil of overstocking, as this is a very common mistake. Many farmers who are able to keep 100 sheep in good condition crowd double that number with the result that the growth of wool is considerably diminished and of inferior quality, and instead of being able to dispose of "fats" yearly when extreme prices are obtainable, they often have to purchase meat for their own requirements. The farmer who keeps sheep for wool cannot do better than invest in a good breed of merino, but it is probable that better results would accrue from breeding lambs for export. For the latter purpose a cross between a good merino ewe and a Shropshire ram has been proved the most payable. Care should be taken to have the lambs drop about the first week in April, in which case, if the season is any way favourable, they will be fit for export about end of September. This will give the ewes an excellent chance to improve before the feed gets too dry. An average weight of about 36—40 lb. is most to be desired. Heavier carcases are deemed too coarse, and realize less per lb. Above all, endeavour to keep lambs free from grass seeds, as the prevalence of these among the lambs exported of late years has exercised a baneful effect, and has often reduced the price realized to the extent of 1d. a lb. The farmer who has an abundance of feed and water has a good opportunity as a rule of purchasing wethers off shears, if price be not too high, fattening them up, and disposing of same about June or July when prices for "fats" always rule high. There is a difference of opinion amongst sheepfarmers as to the advisability or otherwise of weaning lambs from their mothers, but I favour weaning about November, when the lambs are large enough, as this gives the ewes a chance to pick up whilst feed is good. Every farmer should set apart a paddock most free from grass seeds for the lambs when weaned, as the young sheep are always more susceptible to grass seeds than the older ones. This is most important, as those so troubled fall away very quickly. Whenever practicable sheep should be shifted from paddock to paddock as frequently as possible, and even if the grass is inferior they will do better, as if left in one paddock too long it becomes stale to them. In my opinion it would well pay the sheepfarmer to adopt the system general in England, viz., to feed the sheep through the cold wet winter months, as it is after the first rains they commence to lose flesh. Any farmer who puts his corn through a thresher or header would be able to do this at a trifling cost, as the straw when chaffed would make excellent fodder. Long troughs made of galvanized iron or wood would be suitable for this purpose. The aim of the sheepfarmers should be to have sheep fit for market about June or July, and the above system would do it.

After discussion it was resolved that in the opinion of this branch it is advisable to combine sheep raising with farming. Members also thought that in the near future the binder and header and thresher would come into general use, and that this system would provide the farmer with food upon which sheep could be kept in condition during the early winter months.

Orroroo, July 25.

Present—Messrs. J. Scriven (chair), J. Moody, W. S. Lillecrapp, M. Oppermann, G. Matthews, E. Copley, G. Harding, W. Robertson, J. Jamieson, T. H. P. Tapscott (Hon. Secretary), and one visitor.

Curing Bacon and Ham.—Mr. Moody read a paper on this subject to the following effect:—

This was an important matter for farmers, as many of them know to their cost. When they take home-cured ham and bacon to the storekeeper they often find he cannot give them anything like the price quoted in the Adelaide papers, and they cannot understand why other people should get so much more for their produce. In many cases the reasons were easily found, namely, bad cutting up and bad pickling. He was sure that more good bacon was destroyed by the wrong use of the knife than by bad pickling. A large proportion of the bacon sold in Adelaide is factory cured, and one has only to examine it to see how it contrasts in appearance with much of the farmers' bacon. This is a point of great importance, and farmers should give it careful study. To sell well, make the hams and bacon shapely and attractive. True, the farmer has not all the conveniences that exist at the factory, but then they are not required on the farm, where only a few pigs are treated. As they all knew, he had been fairly successful at local shows with his bacon, and his method of pickling was as follows:—Mix together thoroughly 12 lb. Black Horse salt, 6 lb. sugar, 3 oz. saltpetre, and 4 oz. carbonate of soda. Rub this well into the meat, and then stack; rub in each day for three days, and every other day for a week later, taking care to turn the meat each time. Bacon will then be ready for the smoke house; but hams require similar treatment for another week or two, according to their size, before they are ready for smoking. If the meat is properly cut up and cured it should fetch nearly as good prices as factory cured.

After reading his paper Mr. Moody showed by means of illustrations how to cut up a pig to make shapely hams and bacon.

Hawker, July 16.

Present—Messrs. H. M. Borgas (chair), A. C. Hirsch, F. C. Hirsch, J. W. Fisher, R. Wardle, J. Moller, J. W. Schuppan, and J. Smith (Hon. Secretary).

Officers.—The Chairman and Hon. Secretary were thanked for their services and re-elected for ensuing year. The Hon. Secretary reported that during the year nine meetings had been held, four papers read, and the average attendance was over six members. The dry seasons experienced of late had considerably hampered members in their operations.

Selling Wheat.—The Chairman stated that in the April issue he was made to appear to have credited the farmer with trying to get at the buyer in the matter of inferior wheat. What he said was that if the buyers all adopted the practice of refusing badly cleaned and inferior grain it would be no use a farmer going from one to the other endeavouring to secure favours from them in the matter. Mr. A. C. Hirsch understood Mr. Borgas to recommend farmers to clean their wheat well, but the present system of docking wheat 1d. for every 1 lb. under the standard was very unfair.

Carrying Capacity of Northern Lands.—Paper read by Mr. Gillick, of Cradock (see page 727 of Journal for March) was read and discussed, members generally being of opinion that the writer of the paper knew the country he was writing about, and had fairly stated the requirements of the settlers.

Buckbush.—Mr. Hirsch thought they might well do something to conserve fodder by gathering and stacking the buckbush (Salsola kali). All northern farmers considered it a useful fodder, yet it was allowed to dry up and blow away. If cut when green, stacked, and covered with straw it would prove very useful. [It is stated that the closely allied plant, Russian thistle, is being utilized in this way with very satisfactory results in Nebraska.—See article in Journal of Agriculture for September.—Ed.]

Caltowie, July 25.

Present—Messrs. N. Hewett (chair), J. G. Lehmann, L. Graham, J. Neate, J. H. Roth, D. Kerr, J. Leahy, G. Petatz, F. Lehmann (Hon. Secretary), and sixteen visitors.

Sheep and Wool. Mr. G. Jeffrey gave an interesting address on this subject. He advised farmers in this locality to go in for large framed merino sheep, and not to sacrifice size of carcase for fineness of wool. The profits from the large sheep would be greater in the end, and generally they were more robust. Under favourable conditions there was nothing more profitable to farmer than the breeding of fat lambs, and he preferred the large framed merino ewe crossed with a Shropshire ram. Professor Lowrie held a very high opinion of the progeny of the half-bred Dorset-horn ewe mated with the Shropshire, but the merino ewes were most easily obtained by farmers. Farmers should buy ewes for breeding purposes, and they should not hold on to them too long. The farmer must endeavour to get a return from both wool and mutton. When sheep are killed the skins should be taken off carefully as soon as possible, and hung on a rail; stretching on a frame was not necessary The skins should be dried under cover, and protected from weevils. In shearing the wool should be carefully handled, and every care taken to put it on the market in good condition. Care and cleanliness were essential: attention to these points meant increased returns. In reply to questions Mr. Jeffrey admitted that in crossbreeding the Shropshire ewe would make a better mother than the merino, but against that the wool of the latter was always more saleable. He did not advocate sacrificing density of wool for staple, but pointed out the sheep with good staple was generally a large framed animal, and on the farms the dense-woolled sheep would get sandbacked as badly as the open-woolled animal.

Dowlingville, July 25.

Present—Messrs. J. Phelps (chair), R. A. Montgomery, T. Kenny, H. P. Crowell. T. Illman, G. Mason, F. Lombladt, S. Tee, and F. Lock (Hon. Secretary).

Waste of Wealth.—Mr. Montgomery initiated a discussion on this subject. The object of all farmers was to grow the greatest number of bushels of wheat at the least cost. They relied mainly on the wheat, allowing most of the straw to go to waste; but this could be avoided to a large extent by using the binder more. There were several advantages to be gained from using the binder. In a dirty crop the weeds were removed from the field instead of being distributed all over it as was the case with the stripper. Then, if some of the crop is cut fairly early and threshed later on there was a supply of straw of higher feeding value than straw left by the stripper. He thought every farmer should go in for a header and chaffcutter. This would undoubtedly necessitate the employment of more labour, but then the more labour profitably employed the better for all concerned. Mr. Phelps did not consider it any use applying heavy dressings of super; 85 lb. per acre was sufficient. Where they applied up to 200 lb. per acre there was not much difference apparent in the crop. Mr. Kenny thought they should endeavour to keep at least two years' supply of feed on the farm. Mice did less damage in a large stack of straw or hay than in a small stack. Mr. Illman thought the binder a good aid in cleaning the land. One year he harvested part of his crop with the binder, and threshed it in the winter when there was fair feed in the paddocks. He found the stock frequently left the grass to feed at the straw stack.

Standard Sample of Wheat.—It was resolved that this Branch does not agree with suggestion of Paskeville Branch that the State should be divided into several districts, according to climatic conditions, and that the standard F.A.Q. sample should be fixed for each district.

Minlaton, July 26.

Present—Messrs. T. Brown (chair), E. Correll, D. G. Teichelmann, M. Twartz, Jas. Anderson, S. Vanstone, J. Anderson, Jas. Martin, J. Bennett, J. McKenzie (Hon. Secretary), and one visitor.

Fertilizers.—In July issue (page 999) a paper read by Mr. Jas. Martin was incorrectly credited to Mr. Jas. McKenzie.

Destruction of Rabbits.—Mr. Twartz suggested this subject for discussion at the annual congress. Phosphorized pollard had been used here with success, but it seemed to him that if they continued its use they would exterminate the native birds as well as the rabbits. Some method that would not destroy their friends as well as their foes was required.

Making Farm Life Attractive.—The Hon. Secretary read a paper on this subject, to the following effect:—

Much has already been written on this subject, and varied have been the suggestions to make farm life more attractive; but what has been done to effect a cure? It is claimed that the youth of the land is drifting into the cities, where wages are better, hours regular and shorter, and there is more society and entertainment. Every one must admit that life on the farm is far more attractive than it was thirty years ago. Compare the old systems of ploughing, seeding, and harvesting with the present, and it will be seen that the farm worker to-day is better off than was formerly the case. That there is something decidedly wrong in our methods is evidenced by the disinclination of our young men to take up farm work. The main complaint seems to be that farm hours are too long; that the men have to work from Monday morning to Saturday night, and have no time for themselves. There is no question that the regular hours of town work are of great attraction, and naturally so. While he was quite satisfied that it was impossible to work a farm on the eight hours' system, it was certain that as a body farmers must do something to improve the condition of their men He had been a careful observer, as an employer of labour during the past twenty years, and was prepared to assert that he got better satisfaction and more work out of his men and boys by allowing them their Saturday afternoon off than those who did not give this privilege. Of course, during harvest time they had to work all day Saturday if the weather permitted, but none of their men would blame them for this; but the half days lost can and should be made up. Their employes were entitled to their hours of recreation; never mind if they did work harder at football or cricket than on the farm; it was a change, and a chance to associate with others of their own age in friendly games. If a man is kept at work on the farm from morning to night right through the week, is it any wonder that he spends his Sundays on odd jobs for himself? Sometimes the married man on the farm had to chop wood and even cart it on Sunday because he had no other time to do it. There was no doubt that taken altogether the farmers that studied their men in this way benefited in the long run. This also applied to the treatment of their own sons. It would not be a bad plan to encourage them to carry out experiments on their own account. Let them plant and look after trees, try small experiments with manures, &c., if they feel inclined, and give them facilities for doing so. It would interest them in their work, and, in his opinion, not only would it benefit them but their parents also.

Paper was well discussed and most of the members agreed with the writer

Morgan, July 19.

Present - Messrs R. Windebank (chair), H. Hahn, A. Heinrich, H Wohling, J Pope, E. Hausler, W. G. F. Plummer (Hon. Secretary) and three visitors

Wheat Standard - Mr. Hahn favoured payment for wheat according to quality. They had instances of Victoria wheat fetching higher prices in London than South Australian wheat when our standard has been 1 lb. per bushel higher. He believed that if a vote were taken the majority of farmers would favour payment according to quality. Members agreed that the wheatbuyers offered no inducement whatever to farmers to clean their wheat thoroughly, and a resolution was carried unanimously in favour of a fixed standard and payment according to quality.

Water Conservation. - Mr. A. Heinrich read a paper on this subject to the following effect:-

The question of securing a permanent water supply has been uppermost in the minds of settlers on the Murray Flats The long period of drought has compelled them to engage in watercarting for many months and any one who has been in the unfortunate position of having to cart water for stock knows what a troublesome and unprofitable undertaking it is even when the water itself costs nothing. In these districts, however, much of it has to be pumped from deep wells or is brought by train from the Murray, and the unfortunate farmer has to pay for every gallon of it For the individual to conserve a good supply of water, a certain amount of rain is necessary, but they seemed to be getting less rain every year. The summer thunderstorms which were so necessary to replenish large dams, had of late been conspicuous by their absence, and the winter rains too light to put much water into the reservoirs. It is only from dams sunk near rising ground with a good slope of bare catchment surface that farmers have been able to draw much in the way of water of late years, and he would strongly advise farmers to utilize every suitable location of this character. The Government had spent a lot of money in the district in constructing large reservoirs, which rapidly silt up if there is rain enough to fill them, and it was to be regretted that a larger proportion had not been spent in sinking for artesian water even if they had to go down several thousand feet, as a good artesian supply would solve the difficulty right away. He believed nearly all the deep wells from which water was being obtained in the district derived their supplies from the same source, i e., soakage from the River Murray. The wells referred to possess an abundant and apparently inexhaustible supply of water, notwithstanding the continued drought, and he felt convinced the river was the source. These wells are mostly sunk along old watercourses, and the water level is always below the level of the water in the river.

The expense of these deep wells or of large reservoirs was a serious drawback, being beyond the means of the ordinary farmer; but by several co-operating they might secure a permanent supply of water at a reasonable outlay.

Members were of opinion that artesian supplies could be obtained on the Murray Flats if bores were put down to sufficient depth.

Vegetables and Fruit for Early Market—Mr. Plummer read a paper on this subject to the following effect:—

To get the highest price for his produce was the natural ambition of every grower of fruits and vegetables, but they often had to accept low prices when by a little forethought they could have secured a good market. How often did they miss opportunities for the production of early fruits and vegetables. The products were often very high in price and at other times extremely low. With such a variety of climatic and soil conditions this should not be so in South Australia. Want of system was, in his opinion, the cause. In the early districts they should grow early fruits, and in the late districts plant late kinds and so balance the market. It would mean that the consumer would never have to pay very high prices for fruit, while the grower would not suffer from low prices. Only the earliest markets of the season would be likely to see big prices. At present the early districts are marketing the bulk of their produce at the same time as the late districts. The districts should be classified by authorities and recommendations given as to which should be planted with early sorts and which with late sorts. It would, of course, require the hearty co-operation of growers to give effect to this idea. Then there was a marked need for a better system of distribution of produce. It was not rare for fruit in one locality to be very cheap and in another there were people longing for it. At Renmark oranges have been offered at 2/6 per case, while lower down the river 4/ would have been secured for the same fruit. Lemons have been rotting under the trees at a time when hundreds of families would have been pleased to get them at a reasonable price. Fruit and vegetable growers should combine and establish depots at the principal towns, and have carts going into the surrounding country. A large amount of money was being spent to develop the trade with England, while the trade in the State was to a certain extent neglected.

Pine Forest, July 15.

Present—Messrs. F. Bayne (chair), J. Phillis, W. Kempster, G. Inkster, and R. Barr, jun. (Hon. Secretary).

Horses' Teeth.—The necessity for paying greater attention to the condition of horses' teeth was discussed, members being of opinion that much suffering to the animals and loss to the owners could be prevented by an occasional examination of the teeth and subsequent filing where required.

"Bandylegged" Horses.—Mr. Kempster read a short paper on "Breeding and Management of Horses," and referred specially to disease in young horses prevalent in the districts round Pine Forest and Port Broughton. Commencing from the time of weaning many foals develop a weakness in the knee joints, which disfigures them and greatly impairs their usefulness. The knees become large and are soft and yielding in the middle; the forelegs either bend outwards or backwards till at two years old "bandylegs" are fully developed. There were many different opinions as to the cause of this trouble. One most common is that it is inherited from the sire, but he had found the stock of 13 different stallions to be affected. Poor feeding is given by some as the cause, but a neighbour who feeds his young stock fairly well has three out of five of last season's foals affected. He kept the hoofs cut down in the middle, and used bonemeal and Dobson's powders with some effect towards improvement. Too much dry feed is mentioned, also want of salt, but as animals that have free access to a salt lake are affected this could hardly be the cause. He had found Dobson's powders mixed in wet bran and given to the foals from weaning time to the age of 12 months useful as a preventive. The opinion of the Chief Inspector of Stock as to cause and remedy would be appreciated by stockowners. [The Chief Inspector of Stock states that the best authorities are agreed that a deficiency of lime and phosphates in the pastures is responsible for this trouble. In some districts certain farms are invariably affected. The land should be limed and manured and the stock should be given bonemeal regularly. It is not sufficient to give the foals a little occasionally. All stock should be given bonemeal as part of the regular ration.—Ed.]

Port Pirie, August 14.

Present—Messrs. T. Johns (chair), G. M. Wright, H. B. Welch, E. J. Hector, P. J. Spain, G. Hannam, H. Jose, T. A. Wilson. (Hon. Secretary), and one visitor.

Marram Grass.—Mr. Hannan tabled sample of Marram grass planted six weeks previously on drift sand; it was already showing new growth.

Dairying—Mr. Hector read extract from an interstate paper describing the Radiator butter making plant.

Farmers and Farming.—Mr. Wright read a paper on this subject, to the following effect:—

Farmers and farming are looked down upon by many people, and it is amusing to hear remarks in the stores sometimes. Anything that is old-fashioned or out of date is considered good enough for the cockies, and it is said and thought by many of them that any one can be a farmer. I have known some who have tried it, but generally at considerable cost to themselves. What other calling requires a knowledge so varied? A farmer should know the nature of various soils, when and how to break them, for different soils require different treatment. He has to consider climate and locality, and know what to sow, and when. Then he requires a knowledge of horses, how to breed, break, work, and feed them; the same with cattle and sheep. He should also be able to turn his hand to carpentry, blacksmithing, harnessmaking, building, fencing, and many other things too numerous to mention. Many farmers make the mistake of doing things about the place that they could get done for 15/ per week, while they are paying another man 8/ or 10/ per day for doing what they might very well do themselves. Some think farming is drudgery, a slaving sort of work. Certainly he has to stick to his work to make it pay, but it is only those who do so that succeed at anything. About farming you can lay down no hard and fast rules. Take ploughing, for instance. You might stir some soil up for 6 ft. in depth and would not injure it, while other places if you turned it up 6 in. deep you would ruin it for years. It is always well not to turn clay to the top, at whatever depth you find it. While speaking of ploughing I think there is not enough trouble taken over it. In many instances paddocks look like well-hilled potato fields wanting the potatoes; in others the plough seems to have been about as much out of ground as in. The crookedness I would take no notice of, as with our big ploughs and the different soils that you encounter in crossing a big paddock it is almost impossible to keep a straight furrow; but I like to see all the land turned over. All ploughs over two furrows should have a lever for regulating the depth, so that it can be altered as you go along, as what is right for the stiff parts would be too deep for the sandy parts. Fallowing cannot be done too early after the seeding is finished; but in this part of the country we have to plough when we can. It is often asked, What is the best kind of wheat to sow? It is not safe to recommend; what will suit one farm won't another, even at no great distance apart. Some strongly advocate rotation of crops, and where there is sufficient rainfall there is no doubt that that is the proper line to work upon; but in our district it is out of the question, as wheat is the only crop that is hardy enough to pay to grow. Some sow only on fallow, and if they have sufficient land it may be the best plan. I divide my land into three parts—one fallow, one in crop, and one in grass—that is, fallow every second year. This answers very well; but, as with other things, different soils require different treatment. In this district it would not pay to manure stiff lands on account of our meagre rainfall; but on sandy soils it will, and the sandier, so long as it does not drift too much, the better it will pay. Farmers should always keep a year's stock of hay in advance. Never let the stack get in too low a condition if you can help it. Rather under stock than over stock. Look well after your machinery and implements; see that all your bolts are kept tight, as one day's work with a machine loose and rattling will do more harm than a whole season's work if properly looked after.

Mr. Jose drew attention to the practice of fallowing with the scarifier instead of with ploughs, but Mr. Wright thought farmers would find they could not do it in this way for long.

Homestead Meeting.—This meeting was held at homestead of Mr. G. M. Wright. During the course of the usual inspection several labour saving devices adopted by Mr. Wright came in for favourable notice. The one which came in for most attention was a one-man method of greasing wagon wheels. A board is placed on a slant with the top end between the bolt heads under the axle, the wagon is then forced back by means of a lever in front of the wheel. As the wagon backs the board is straightened, and the wheel raised, then block the front wheels and it can be greased in the usual way. After the inspection members were entertained by Mr. and Mrs. Wright, a hearty vote of thanks being accorded them for their kindness.

Burra, August 8.

Present—Messrs. F. A. Field (chair), F. G. Dawson, E. Goodridge, J. Duldig, J. A. Arnold, W. Heinrich, Jas. Scott, R. M. Harvey, (Hon Secretary) and one visitor

Wheat Cleaning- Mr. Duldig read a paper on this subject to the following effect:—

First select a good, hard, level piece of ground for a floor. It is a good plan to select the floor early, and cover it with old straw or wheat chaff during the winter, and leave it on until about a month before reaping. Covering with straw keeps the ground moister, and the wetter it is during the winter the harder it will be when dry. The floor must be cleaned well before being used. A good winnower is absolutely necessary, it does not pay to use a patched-up, old machine, as is often done. In feeding the machine use a wooden fork or scoop, with five tines. A shovel is likely to pick up stones and earth. Run the wheat through two or even three times if necessary. Every farmer should endeavour to put only first-class samples on the market, and not take every grain, large and small, that they grow. He had seen samples that were a disgrace to the farmer who brought them in. The wheatbuyers were greatly to blame, as they did not dock the badly cleaned wheat as they should. If farmers would clean their wheat better there would not be so much dissatisfaction about the standard sample of wheat. In filling the bags put as much wheat in each as you possibly can. With bags at the price they are it is important that they should use as few as possible.

Members were generally of opinion that the wheatbuyers were often to blame as they did not encourage the farmers to clean their wheat carefully. Cases were mentioned where farmers had received the same price for dirty wheat as for clean samples. Buyers should pay more for good clean samples, and farmers would quickly find out that it was to their interest to exercise greater care in cleaning their wheat.

One Tree Hill, August 15.

Present—Messrs. J. Bowman, (chair), F. Bowman, G. Bowman, G. Flower, F. L. Ifould, W. Kelly, E. A. Kelly, M. G. Smith, and J. Clucas (Hon Secretary).

Rabbits -Mr. Hogarth wrote that the method of destroying rabbits which the inventors recently brought under the notice of the Branch had been tested on his land, but it was not a success.

Manures for Grass—A member called attention to the exceptional condition of the grass on a paddock that had been manured when in crop two years previously, showing that the results from the application of manure could be seen for several years.

Morphett Vale, August 5.

Present -Messrs. H. Smith (chair), L. F. Christie, J. Bain, E. Perry, A. Pocock, A. Benny, J. Depledge, T. Anderson, and R. Ross Reid (Hon Secretary).

Cultivating Implements—During the previous month a trial of vineyard ploughs and cultivators was held at Mr. Benny's vineyard. Several of the implements tried had been in daily use by local growers. Messrs. Smith and Benny spoke favourably of the Massey Harris cultivator, while the Planet Jr. tools were also satisfactory. A cultivator, made by Messrs. Schrapel & Co., of Tanunda, was also shown and did good work. The price was stated to be less than similar imported implements. A machine for distributing manure in vineyards was shown by the Australasian Implement Co., and was much appreciated. The manure is distributed in the furrow behind the plough. It was thought that the box holding the manure might be increased in capacity for sowing gypsum or low grade manures.

Fallowing.—Discussion on this subject took place. It was generally agreed that in this district farmers should fallow earlier, working the land deeply, but at the same time avoid bringing the clay or subsoil to the top. All stable manure available, both fresh and rotten, should be ploughed in the fallow land; harrow as soon as possible after ploughing.

Stockport, August 18.

Present—Messrs. F. Watts (chair), D. G. Stribling, J. F. Godfree, G. S. Thomas, A. Branson, T. Howard, A. Callier, T. Megaw, J. Smith, T. Hogan, and J. Murray (Hon Secretary).

Odds and Ends.- Mr. J. Smith read a paper under this title to the following effect:—

Much is being said at the Bureau meetings on all sorts of topics, but he was afraid a great many suggestions that were made were not put into practice He did not wish to find fault with any one, but thought that if people would put into practice what they talk and write about much good would be accomplished. He was going to make a few suggestions which he thought were worth carrying out. He would advise farmers to erect good sheds for their implements, and to put the implements in the sheds when not in use. The other day he saw a stripper under a sugar-gum tree, the winnower in the paddock with no shelter at all, and the spring dray housed on the public road. Every farmer should have a toolhouse, and a few tools required for making repairs and doing small jobs about the place. Keep the tools in good order. Often just when a chisel or axe is particularly required time has to be spent in making them fit for use. Keep the tools in their place, so that you know where to get them when you want them. Something might be saved by loosening the bolts on vehicles and machinery after the summer and before putting them away, as the damp causes the wood to swell, and if the bolts are tight they injure the woodwork. Harness should be carefully overhauled at least twice a year.

In reply to question as to best kind of shed to erect, Mr. Smith advised stone walls and iron roof where they can afford it; otherwise good straw thatching. Mr. Megaw said wirenetting over the straw kept the roof in good condition, much longer than otherwise would be the case. Mr. Godfree considered oiling the harness once a year sufficient, too frequent oiling caused the leather to perish. Discussion arose as to best oil to use for softening leather; neatsfoot, neatsfoot and tallow mixed, castor oil, mutton fat, and others were mentioned, but no decision arrived at.

Lyndoch, August 14.

Present—Messrs. H. Kennedy (chair), W. Rushall, A. Springbett, J. W. Thomas, W. J. Springbett, R. Ken, Jos. Woolcock, M. Burge, R. Ross, R. Loveridge, and J. Murray (Hon. Secretary).

Officers—Messrs. H. Kennedy and J. Mitchell were re-elected Chairman and Hon. Secretary respectively, and Mr. R. Ross elected Vice-Chairman.

It was decided that unless otherwise authorised by at least ten members, the levies in any one year should not exceed 5/ per member.

Grafting Vines—Mr. W. J. Springbett initiated a discussion on this subject. September was the best month for grafting vines in this district; the scions should be selected early and buried in fairly moist sand to prevent them drying and at the same time to keep them dormant. In reply to request, Mr. Springbett agreed to read a paper on the subject at next meeting.

Cherry Gardens, August 12.

Present—Messrs. W. B. Burpee (chair). T. Jacobs, J. Lewis, C. Lewis, G. Hicks, G. Brumby, A. Broadbent, J. Metcalf, T. Partridge, E. Woods, C. Ricks, (Hon. Secretary)) and one visitor.

Rats—Mr. Jacobs reportd that he and a neighbour were much troubled by the common house rat, which had invaded their properties in large numbers. Mr. Broadbent stated that some time ago, he was similarly troubled, so he poured pure carbolic acid down the holes that he could find. The result was that the rats had cleared out, and had apparently transferred their attention to his neighbour, Mr. Jacobs.

Bush Experiences—Mr. Partridge gave a very interesting account of his thirty-five years' experience in bush life.

Millicent, August 7.

Present—Messrs. S. J. Stuckey (chair), H. F. Holzgrefe, H. A. Stewart, A. E. Hutchesson, H. Warland, B. Varcoe, H. Oberlander, R. Campbell, J. Davidson, H. Hart, and E. J. Harris (Hon. Secretary).

Rainfall and Irrigation—The rainfall recorded at Millicent for July, was 2.21 inches, and at Mt. McIntyre, 2 inches; the record for seven months shows shortages of 6.82 inches and 9.45 inches respectively as compared with same period last year. Referring to the dry weather the Chairman mentioned that he had frequently advocated keeping the water in the drains from October onwards during the summer. Considerable discussion on the subject ensued, there being a marked difference in the views of members. Some quoted instances of good results from the practice while the experience of others was just the reverse. Mr. Hart considered the difference due to the different kinds of soil; he believed in irrigation downwards but not upwards. Members generally deprecated the idea of obtaining vegetables from Adelaide; there were numerous small areas in the district where any one who liked to take the trouble could grow enough vegetables to supply the district. Salsify, asparagus, and Jerusalem artichoke were mentioned as delicious vegetables not often grown. Mr. Campbell tabled several varieties of potatoes, the product of seed originally introduced by the Chairman of the Central Bureau. Gratia in particular was a splendid eater and a good variety. Mr. Campbell also showed two sorts of green rye, one was the second cutting from crop sown on February 22; the other was sown on March 14, and was only just ready to cut. Even now it was not so far forward as the second growth of the earlier sown.

Mount Compass, August 9.

Present—Messrs. R. Peters (chair), M. Jacobs, A. Sweetman, F. McKinlay, H. McKinlay, D. J. Hutton, F. Slater, E. C. Good, S. H. Herring, C. S. Hancock, R. Cameron, W. Gowling, A. J. Hancock (Hon. Secretary), and one visitor.

Humus—Mr. Sweetman gave an interesting account of a recent visit to Mount Gambier, and also read a short paper on humus. Humus was decayed vegetable or other organic matter. It has various functions in connection with the growth of plants, and its value will depend largely on the source of origin. It supplies some plant food, it absorbs and holds moisture, it keeps the soil loose and mellow, and is generally a very important factor in cultivation. Land that has a tendency to set hard can be made free and mellow by a good heavy dressing of farmyard manure. When it could be obtained the best way to add humus to the soil was by means of barnyard manure as other plant foods were also added. The nitrogen gathering crops were next best, and of these clover was generally considered most suitable where a good crop can be grown. It is, however, quite possible to have too much vegetable matter in the soil, and where this occurs a dressing of lime will correct acidity, and hasten the decay of the vegetable matter. Mr. H. McKinlay stated that he had been trying a top-dressing of a white clay on his swamp land; the results were satisfactory, and the clay was more easily obtained than sand, beside giving better results.

Codlin Moth—It was resolved that this Branch is opposed to the proposal to allow of codlin moth infested fruit being sold.

Port Broughton, August 18.

Present—Messrs. W. R. Whittaker (chair), W. J. Dalby, E. Dalby, J. Harford, E. Gardiner, G. E. Patingale, B. Excell, E. Dennis, H. Allchurch, W. Tonkin, and J. Barclay (Hon. Secretary).

Annual Report—The Chairman reported on the year's work. Ten meetings had been held with an average attendance of eight members. The officers were re-elected, and thanked for their services.

Inkerman, August 12.

Present—Messrs. D. Fraser (chair), C. H. Daniel, A. Tozer, R. Kennedy, W. Board, F. C. Smart, W. W. Mugford, W. Fraser, C. E. Daniel (Hon. Secretary), and two visitors.

Castration of Colts—In reply to question as to best time to perform this operation, Mr. C. H. Daniel said he considered in this district it should be done not later than August. At one time he lost three valuable colts through having the operation performed too late in the season.

Milk—Mr. Kennedy read a paper on this subject:—

The art of milking well is not learnt in a hurry; it requires long practice, and therefore young people on a farm ought to be shown how the work should be done. It is quite important that this should be particularly attended to, for a good milker obtains at least a quart more from the same cow than a poor milker. The first lesson to be taught is gentleness and kindness to the cows. Cows that have been caressed and well-treated are fond of having the milk drawn at the regular time of milking. Let the young people be put to milking the farrow cows first, or such as are to be soon dried; and then the loss from bad milking will be less injurious. The hands should extend to the extremity of the teats, for the milk is then drawn easier. They should be taught to milk as fast as possible. More milk is always obtained by a rapid milker than by a slow one. They should sit up close to the cow, and rest the left arm gently against her shank. Then, if she raises her foot on account of pain occasioned by soreness of the teats, the nearer the milker sits to her and the harder he presses his left arm against her leg the less risk will be run of being injured. Cows may be taught to give their milk down at once, and they may be taught to hold it a long while. The most important part in the operation of milking is perhaps to milk clean, to take out the whole of the milk from the udder. Not only is the last portion the richest in cream, but there is not a more certain way of drying a cow than allowing a part of her milk to remain in her udder. It is a good plan, but too generally neglected, to wash the udder with warm water before milking, nor is it of less consequence to have a good-tempered milker. An ill-tempered milker will often spoil a cow, and if she once holds up her milk it is a proof that the milker is defective or disagreeable to the animal. A free, decided, but gentle grasp of the teats and a full and vigorous stream of milk are the marks of a successful milker. It is desirable to rub and stroke the udder when the stream ceases, to encourage the delivery of any milk that remains, nor is it a bad plan for the milker, or in large dairies for the master, to take a small measure, and follow the milker, to strip all the cows. Women are by far the most capable of milking; their hands are more gentle and delicate, and the cows seem to generally prefer them. I would suggest a few rules which might be advantageously acted upon. If you would have a gentle cow be gentle yourself. If a cow kicks much have a switch under the left arm, the pail in the left hand, and if, while milking, she kicks let this act be invariably followed by a single blow. Never strike but once at a time, even if she kicks so hard as to break your leg, and never omit it if she hits only the air. A small mess of pleasant food at the time will serve to do away with any disagreeable impression in connection with the milking. To be a good milker you must pare your nails short, sit on a stool, milk fast, never scold a cow, never get out of patience, tie the cow's tail to her leg in fly time, and don't wet the teats with the first stream of milk, as milk dries and forms a glossy varnish, which tends to cause cracking or chapping. Cold or a little warm water is much better, becoming quite dry by the time the milking is finished. Milking should always be performed at a regular time morning and evening. Regularity in this respect should be observed.

Gumeracha, August 18.

Present—Messrs. A. Moore (chair), D. Hanna, J. C. Gall, J. Monfries, J. Kitto, W. V. Bond, J. R. Stephens, A. E. Lee, W. Cornish, W. A. Lee, and T. W. Martin (Hon. Secretary).

Poultry—Mr. Monfries read a paper on this subject to the following effect:—

There is more money in poultry than most people think. On most farms the management of the fowls is left to the womenfolk, who have quite enough other work to attend to. To make a success of the industry it requires the special attention of one individual. It is first necessary to ascertain what breeds are most profitable in each locality. This district, being colder and wetter, is not so suitable as Yorke's Peninsula or the Murray Flats for egg production, and we must pay more attention to the breeds that produce table poultry. Where eggs can be most profitably produced the lighter breeds, Leghorns, Minorcas, and others, should be kept; but here the heavier birds were more suitable. He found the Wyandotte a good, all-round bird, and crossed with the Orpington, produced a splendid fowl, the chickens being hardy and the pullets early layers. The Indian game crossed with the Orpington or Wyandotte made a splendid table fowl. Proper attention to feeding, housing, and cleanliness was essential to success, particularly where only a small run was available. Last year our exports of eggs and poultry reached the value of £76,000, and in his opinion the export of poultry was only in its infancy. With care it was possible for any breeder to develop good laying strains by breeding only from proved good layers. He considered geese most profitable. Some will complain of the damage to the haystack and to the crop. The first can be prevented by running wire netting around the base of the stack, while the returns from the sale of young geese will more than compensate for the little green stuff they devour. There is but little trouble in rearing goslings. From 10 geese it should be possible to rear 100 goslings, which if topped up would at Christmas time readily fetch 4 . or £20 the lot. A cross between the Toulouse gander and the common goose produces a good, large, weighty bird. Geese, like other table poultry, should be sold by weight, as it would encourage breeders to produce birds up to 30 lb. or even 40 lb. a pair. He considered turkeys as profitable to the farmer as pigs, as young gobblers seven months to eights months old will weigh 22 lb. and hens 13 lb. At 5d. to 7d. per lb. live weight there is money in this branch of the poultry industry. Turkeys required a good wide range to roam over, and will do well if left to themselves to a large extent. The young ones are easily reared. Keep the mother in a good, roomy coop, with board floor, which should be kept clean and be well sprinkled with sand and fine gravel. The coop should be placed where there is a nice run of close-cut grass for the chicks. When they are three weeks' old the hen may be allowed to run with the young ones in the daytime. The turkey did not attain full weight until its third year. The best strains of Bronzewings will average 30 lb. for gobblers and 16 lb. for hens. With regard to ducks, his experience was that they were unprofitable, and he would sooner keep a pig than a lot of ducks. They will eat as much as you have the courage to provide them with; but with bran at 1/7 and pollard 1/8 per bushel it required a very large heart to accept the risks. He thought, however, under ordinary circumstances it would pay to rear ducklings expressly for marketing at 10 weeks to 12 weeks old. The cross between the Pekin and the Aylesbury would prove suitable for this purpose. He had been greatly disappointed with the Indian Runner ducks. While his were decidedly unprofitable, a friend, who had 22 of them, told him that 20 eggs a day was nothing unusual, and this for months. It was evident that a very great deal depended upon the strain, as some were very poor layers.

A very intersesting discussion ensued on the feeding of poultry, and the use of the incubator.

Finniss, August 4.

Present—Messrs. J. Chibnall (chair), T. Collett, H. Langrehr, A. E. Henley, and S. Collett (Hon. Secretary).

Farming—Mr. Henley read a paper on this subject. His experience with manures had been decidedly profitable, and he attributed this partly to the fact that he had applied different kinds of manures, viz., Thomas Phosphate, then Mineral super, followed again by Thomas Phosphate, and finally with bone super. Where he used Mineral super for two years in succession on the same soil, the second year's crop was far from satisfactory. He also paid considerable attention to selection of seed, and change of crop; his practice was to grow two crops of wheat, then oats, and then leave the land out for a year or two, or grow another crop of oats. He fallowed to depth of 5 inches, or 6 inches; but stubble land not more than 4 inches. A few sheep should be kept, to make the most of the stubble and surplus feed, especially where dairy cows are not kept. It was important that overstocking should be avoided; his experience was that there was more profit to be obtained from a smaller number of sheep and less risk of loss. This also applied to all stock. Mr. Henley agreed to read paper at Port Elliot Conference.

Tatiara, August 16.

Present—Messrs. W. E. Fisher (chair), T. Hall, F. Smith, H. Killmer, P. Low, H. E. Hughes, and T. Stanton (Hon. Secretary).

Roadster Horses—It was decided to ask that the question—What is a roadster horse and how to breed it? be discussed at Congress.

Journal of Agriculture—Members wished to know why the usual notes on vegetable growing had been omitted of late from the Journal. [Press of other work is Mr. Quinn's answer.—Ed.]

Balaklava, August 9.

Present—Messrs. A. Manley (chair), G. Reid, W. H. Thompson, W. Smith, W. Tiller, G. C. Neville, E. Hains, T. A. Thomas, J. Vivian, and E. M. Sage (Hon. Secretary).

Hay—Mr. Hains initiated discussion on the best stage at which to cut wheat for hay. He did not consider the early wheat as good as the later kinds, while the solid straw wheats were of little use for hay. He would cut the crop as soon as the bloom was off and before any grain was formed. It was not possible to get it at its best for hay, and yet have grain in it. Stock kept better on hay cut early than on what might well be called straw with a little grain in it. Straw after the header was quite useless for fodder; it might keep it alive, but so would cocky chaff, but horses could not work on it, or even keep healthy. Of oats he had only tried Cape oats for hay, they made hay or cocky chaff. Members were practically unanimous in supporting Mr. Hains's remarks as to time to cut hay, and in condemnation of header straw. [Many farmers not only in this State but in other parts of the world make a practice of feeding chaffed header straw with crushed or boiled grain to their working horses, and they will be equally strong in their opinion as to the value of header straw as members of this Branch are in condemning it. Ed.] Opinions were divided on the subject of oats for hay. Algerians were condemned for hay unless left until fairly ripe. Mr. Reid reaped them before they were quite ripe, then cut the straw at once with the mower, and found his cows and loose stock ate it readily. Members generally preferred to strip the oats and feed the grain with wheaten hay chaff instead of using so much crushed or boiled wheat. Messrs. Manley and Thompson consider Cape oats as good as the best wheat for hay. The latter found his stock took readily to Champion oats as hay, while Mr. Vivian said his stock did well on Scotch grey oats cut at almost any stage.

Amyton, August 14.

Present - Messrs Jos. Gum (chair), W. Mills, J. Kelly, Jas. Gray, T Gum, W. Hughes, G. Wheadon, S. Thomas, F. Mullett (Hon. Secretary), and three visitors.

Stock Complaints Mr. Thos. Gum reported sudden death of a cow, which on being opened showed no sign of anything wrong except that the caul presented a peculiar spotted appearance. Cows were also reported to be suffering from swellings on the underpart of the jaw, which discharge offensive matter when they break. [Stock Inspector will visit the district. Swellings should be lanced when ripe, and bathed well with carbolic solution. - Ed.]

Feeding Farm Stock--Mr. Mills read a paper on this subject to the following effect:—

> We are living in a part of the state where the rainfall is not the best, and our food for stock at times is very limited. Where possible the binder and header system is a splendid way to provide good, clean fodder for stock. A great many farmers ignore the value of good, clean straw, but he considered that straw gathered immediately after the stripper is of great value in feeding stock. This last three or four years he stacked all straw available, and found it a great help in tiding his stock over these dry times. A chaffcutter should be on every farm, as all fodder can be used to better advantage and with less waste if chaffed. Horses will do a lot of work on two parts of straw and one part of hay. If he is in good condition 25 lb. of this chaff, with 5 lb. of bran, will enable a horse to do a large amount of work. If bran was used more freely when the food is dry and fibrous there would not be so much fatality among stock. It is a good thing to clear sand from horses, and to stop that dreaded disease, impaction, among cattle. Spring or well water is more healthy than dam water; it has a more relaxative tendency. The cow is a machine converting the food she eats into milk. Chaff and hay with bran makes splendid food for cows, and they will give a good return if fed and milked regularly.

Considerable discussion ensued. Members were unanimous as to the feeding value of bran. Mr. Kelly was not satisfied with chaffed hay alone for his horses; something extra was necessary. Some members preferred chaffed straw to wheaten chaff. Bran was generally preferred to pollard. Mr. Jas. Gray pointed out that unless the binder was used there was too much foreign matter in the straw from the wheat paddock.

Mount Gambier, August 9.

Present—Messrs. W. Mitchell (chair), A. J. Wedd, D. Norman, sen., D. Norman, jun., J. Dyke, T. H. Williams, J. C. Ruwoldt, M. C. Wilson, J. Kennedy, T. Edwards, and E. Lewis (Hon. Secretary).

Milk fever—Mr. Edwards pointed out that he was credited with giving carbonate of soda for milk fever; it should have been for bloat or blown in cattle.

Lice in Sheep—Mr. Williams reported that lice were again appearing in a number of flocks, particularly in those of small owners. Poor sheep were said to be more susceptible, and the season was also blamed, but he was sure even poor sheep could be kept clean with a little attention. Whenever owners noticed any sheep pulling at their wool they should dip at once. The loss in wool alone was serious. He believed in the end they would have to resort entirely to the poisonous dips, and with crossbreds to dip them twice each year. He was not supposed to advertise any particular dip, but he could not help noticing that the sheep dipped in Cooper's dip were better and freer of vermin than where other dips were used. Other members agreed that it seemed to remain effective longer than other makes. The trouble from stragglers which were missed in rough country, and also from wandering sheep from undipped stocks was referred to; they frequently reinfected sheep that had been treated, and wasted the owner's time and money.

Baroota Whim, August 16.

Present—Messrs. F. H. Flugge (chair), C. F. Bessen, A. Spencer, A. Raneburg, and C. W. Hoskin (Hon. Secretary).

Sheep Manure for Wheat Crops—Mr. Flugge reported that where he had drilled in about 40 lb. per acre of sheep manure with the seed, wheat came up strong, and kept much fresher than wheat drilled in at the same time; it was quite 4 inches higher and was standing the dry weather better than the other crops. Members reported that the crops generally were suffering from want of rain, and the feed was dying off rapidly.

Minlaton, August 9.

Present—Messrs. T. Brown (chair), W. Honner, E. Correll, Jas. Martin, S. Vanstone, A. McKenzie, J. Anderson, R. G. Newbold, Jas. McKenzie, (Hon. Secretary), and one visitor.

Drill-ploughs—Mr. Newbold read a short paper on the advantages of the drill-plough, especially for farmers having light or scrub lands. In many cases on such land there is a lot of small bush and rubbish that must be cleared away before an ordinary drill can be used, but with the drill-plough the clearing for the ordinary stump plough is sufficient. In loose fine land crops put in with the drill-plough are as good as those put in with the ordinary seed-drill, but not so on stiff hard soils. It is undoubtedly a great labour saver; starting with a six-furrow plough about the middle of April you can on clean land get in about 300 acres by the end of May. The time and labour taken in drilling is all saved. Then again, if the stubble has not been well burnt there is no necessity to clear it before sowing with the drill-plough. On fallow land that has any rubbish on it ploughing or scarifying is necessary before using the ordinary drill, whereas the other machine does all the work at one operation. Then the drill-plough scatters the seed somewhat instead of crowding it in rows; this he thought was an advantage. He considered the machine one of the greatest labour-saving implements brought before the farmers of late years. An additional advantage was the lesser outlay and the saving of wear and tear. The drill attachment can be quickly removed, and the plough used for ordinary purposes. Most members agreed that the drill-plough did good work, and saved a lot of labour in rough, stony, or stumpy ground, but on fallow land opinions were divided as to its merits. In reply to question, Mr. Newbold said he found the seed germinated quicker where it was put in with the drill-plough, and was not so likely to malt.

Swan Reach, August 16.

Present—Messrs. F. F. Brecht (chair), F. W. Hecker, J. L. Baker, J. G. Arnold, D. Rowe, R. J. Harris (Hon. Secretary), and two visitors.

Fallowing—The Chairman read a paper on this subject. He advocated fallowing as soon as possible after finishing seeding operations, work the land down fine with the cultivator, and go over it after every rain. Put in the seed with the drill and about 50 lb. mineral super per acre. If possible change the seed every year; on sandy land sow seed from clay or black soils. Dart's Imperial, Early Para, and Steinwedel, were among the best kinds to grow in this district. Mr. Hecker agreed that where wheat was the main crop fallowing was necessary. He had known good crops to be grown on the Murray Flats on well worked fallow, while the wheat on the unfallowed land had been a complete failure. On sandy land inclined to drift, Mr. J. L. Baker advised sowing melons and sorghum on the fallow. Mr. F. H. Baker stated he had kept from drifting a large sand hill that he fallowed, by working it occasionally with the disc cultivator.

Melon Growing—Mr. J. L. Baker read a paper on this subject. In this locality the best way to grow melons and similar plants without irrigation, was to select a deep sandy patch on the south-east side of a sand hill, and well away from scrub and brush. Land likely to drift should not be selected. Fallow the land in June, and keep it well worked to destroy the rubbish and conserve the moisture. Fence and wirenet the patch and sow seed about 3 inches deep, as soon as the land begins to get warm. Do not put manure in with the seed, but a good dressing fallowed in in June will be beneficial. Put three seeds in each hole and make the holes about 10 feet apart; only allow one or two plants to grow at each spot. He had grown melons among his trees and vines for seven years in succession, and had good results. Deep ploughing and thorough working was necessary. In the orchard the melon plants helped to keep the sand from drifting in the summer time. Seed could be sown as late as December, if good summer rains are experienced, but from the middle of August to the middle of September was the most reliable time for sowing. It may be necessary to pollenate the female flowers to secure the fruits setting, but this is a very simple operation. A few pegs driven in the ground will help to prevent the vines being blown about. Mr. Hecker said he found that a good plan for getting the plants to start early was to sow the seeds in a small hollow, and cover with glass until danger of frost is over.

Forster, August 12.

Present—Messrs. E. Schenscher (chair), W. Johns, J. Johns, S. Retallack, J. Johns, F. Johns, F. Towill, Jno. Johns, (Hon. Secretary), and three visitors.

Stable Manure—Mr. A. Johns read a paper on this subject. He considered the best way to utilise the manure about the farm was to rot it in a pit. Make a pit about 12 feet by 10 feet by about 5 feet in depth, in a depression where the water will drain into it. Cart the waste from the old chaff sheds, and other litter, and put a good layer in the bottom, then add any fowl manure, ashes, and other material that will decay. Cart in the stable manure from time to time, and let it all remain in the pit through the summer. By the autumn the manure should be all rotted, and seeds of weeds will have been destroyed. The application of well rotted manure will give good results.

Mount Pleasant, August 8.

Present—Messrs. F. Thomson (chair), P. Miller, J. F. Miller, R. Godfree, V. Tapscott, and H. A. Giles (Hon. Secretary),

Business—Mr. Godfree reported that some wheat drilled in with super was coming up very badly. The manure was apparently of little value. Stock were reported to be doing well, but wheat crops are coming on very slowly, and irregularly. The Hon. Secretary stated that his crop of horse beans was doing better than any of his grain crops.

Mannum, August 15.

Present—Messrs. J. G. Preiss (chair), E. A. Ramm, F. E. Schuetze, R. Heidrich, R. P. Scott, J. G. Lenger, A. Faehmann, J. W. Walker, J. H. Wilhelm, J. L. Scott, J. W. Haby, J. A. Schulze, and W. G. Wilson (Hon. Secretary).

Marram Grass—A long discussion took place on the possibility of Marram grass growing successfully on the drift sands around Mannum. Several members intimated their intention of trying some experiments if the roots could be secured at a reasonable price.

Saltbush—Mr. Walker tabled sample of creeping saltbush from the river flats. Cattle, sheep, and pigs ate it readily and did well on it.

Macaroni Wheats—The Chairman read article from an American paper on Macaroni wheats. Members wished to know whether the wheat could be procured in Adelaide, as they would like to give it a trial next season. [As there are a score of so-called Macaroni wheats it is impossible to answer question without more information.—Ed.]

Manures—Considerable discussion took place on the value of the different kinds of phosphatic manures.

Bureau Meetings—It was decided that in future each member should take it in turn to open discusion or read a paper.

Ardrossan, August 16.

Present—Messrs. G. J. Freeman (chair), C. Cane, C. Dinham, R. Dinham, G. Woods, J. Henderson, J. Carnish, E. Bowman, and N. Opie (Hon. Secretary).

Breeding and Raising Stock—Mr. C. Dinham read a paper on this subject to the following effect:—

No subject is of greater importance to the farmer, even if he rears only one colt each year this should be of the best possible. Every farmer can by observation and judgment steadily improve the quality of his stock. There is no class of work that horses are called upon to perform that has not its peculiar requirements. It is therefore necessary for the breeder to decide beforehand what class of animal he intends to raise. If for market he must know the requirements of the markets accessible to him, and aim to produce the class of animal likely to find a ready sale at remunerative price. He must always remember that the best stock are cheapest. It costs no more to feed and shelter a good horse than it does a "scrub," while it takes less to keep him in condition. His movement is always smoother and steadier for the same rate of speed, his temper is generally better, his pluck and energy none the less, and if it is necessary to put him into the market he commands a better price. The service of a stallion known to be of good, generous blood, and possessing adequate powers of transmission, must, of course, cost more than an inferior horse; and there must be a dam adapted to produce a foal of the best type. The "penny-wise-pound-foolish" policy of refusing to avail one's self of such is everywhere apparent. Taking it for granted, then, that the best in this case is always the cheapest, that the finer and purer the horse can be then it remains to consider some salient points:—

(1). Hereditary tendencies to be guarded against. A caution most needful to be insisted upon is that relating to transmission of disease.

(2) Often mares at an advanced age, too stiff, too weak, too slow for work, are turned to account for breeding, and the result is a weak foal, lacking thrift and spirit.

(3). Choose a vigorous stallion, free from blemishes, malformations, and hereditary taints, and a mare middleaged and vigorous. No mare should be used for breeding till four years of age.

(4). If the mare is deficient in any point the horse should be full or dominant in that. or vice versa.

(5). The mare should be proportionately as large as the horse.

A few main points of a good horse may be mentioned. Begin to judge him from the ground; a good set of feet and legs, nice clean, flat bone, and fine hair. A nice straight shoulder for a draught horse is best, as they are more likely to be stanch, as the collar does not draw up so readily. I like a horse's legs well on the outside of his body, ribs well sprung. full in the loin, well ribbed up, with lots of length in the rump, and a short back. A mare should be heavier behind than in forequarters. A dam with a clean head and neck and fine wither is far more likely to breed a good walking horse, and this is one of the main points of any breed. Look out for good temper in both dam and sire.

Eudunda, August 18.

Present—Messrs. J. von Bertouch (chair), A. E. Gosling, H. D. Wiel, E. J. Pfitzner, J. Lampard, C. Pfeiffer, W. F. Sieber, W. F. Krummel, J. A Pfitzner, J. H. Walter, W. H. Marshall (Hon. Secretary), and one visitor.

Saltbush—Question was asked as to best time to gather saltbush seed and the best time to plant. Members desire information of other Branches on the subject.

Manuring Green Crops—Members wish to know whether broadcasting manure over a green crop, such as barley, after cutting, would have a beneficial effect. [This would largely depend upon the rain, and also upon the kind of manure. If readily soluble manures were applied and sufficient rain falls to dissolve and carry the fertilizer to the roots of the plant, there would be an increase in the crop.—Ed.]

Sorghum—In reply to question members expressed the opinion that 4 lb. to 6 lb. of Sorghum seed per acre was sufficient to sow with the drill.

Poultry Farming and Marketing of Eggs and Poultry—Mr. J. von Bertouch read paper on this subject to the following effect:—

Considerable controversy exists about payable poultry farming and as to the best payable branch. I consider egg production will, with systematic management in a suitable locality, pay better than raising poultry for export or table purposes. Farmers should improve their poultry, firstly, by introducing annually pure bred roosters of the most approved egg-laying kinds, such as Minorcas, Leghorns (white or brown), Wyandottes, Black Orpingtons, or Plymouth Rocks; the three latter are good, all-round utility sorts, suitable for table purposes as well as for laying. As you cannot hatch only hens it appears to me that the best plan is to breed from pure stock of the best laying kinds, and every second year introduce one or more of the utility kinds, crossing so as not to produce birds too motley in appearance, and sell out all cockerels at about four months old. Do not keep them until full grown, for it will not pay to do so. It costs about 5d per dozen to produce eggs. Birds up to four months old will cost about 9d. each to produce, and every bird will cost 4 a year from the time of coming to maturity if all feed has to be bought. In my calculation which is made on the scale of 300 birds on the farm, kept in flocks of not exceeding 60 in each (large flocks will not do well), due allowance has been made for cost of food, netting fences, housing, interest on capital invested, rent of land, and 10/ per week for labour. The average of the laying birds should be at least 10 dozen eggs per hen per year, which at 9d per dozen will give 7/6 per hen gross results. Net results will vary according to care and attention bestowed on the birds and their feeding and the time of selling eggs. In the late spring hens should be kept apart from roosters, so as to produce infertile eggs, which should be preserved until March, April, or May, to obtain better prices. Every poultry farmer should make provision for summer greenfeed for his birds by growing kale, broad-leaf mustard, rape, mangolds, lucerne, &c. It is absolutely necessary to keep all houses and pens thoroughly clean; the droppings (which are worth from £2 to £4 per ton as manure, according to manner of treatment) must be cleaned out frequently, not less than twice every week. All roosting houses must be whitewashed often to prevent or exterminate tick and other vermin. I have found the following limewash to act perfectly, viz.:—To 7 lb. of fresh lime add two tablespoonfuls each of carbolic acid and flowers of sulphur; then pour about 4 gallons of boiling water on, and apply freely while warm. Drinking troughs must be kept clean, and fresh water given twice daily in summer. Do not allow it to become sun-heated, or your birds will suffer from diarrhoea. Add about one tablespoonful of Douglas Mixture to each quart of water. Make dust baths of ashes and road dust. The addition of sulphur to it is beneficial. It is important to arrange roosting houses so as to be free of draught. Diseased birds must be isolated and kept in sheltered places.

Hitherto poultry and eggs have been marketed in a manner not satisfactory to the producers. The fault lies in a great measure with themselves through unsystematic management, carelessness as to mode of forwarding, and inattention to grading both birds and eggs. Portion of the blame must be attributed to the produce depots, the middlemen, and salesmen, who simply dispose of birds and eggs as forwarded by their clients, who in many cases are ignorant as to the best way to market their products. Steps should be taken to secure to the producer fair value for his products, and to encourage the development of the poultry industry. In the first instance, live birds should be graded as to size and quality before marketing, and both live and dressed poultry should be sold by weight. Eggs should be sold by weight instead of by the dozen, and be graded as to colour and size before being put on the market. Turkeys are generally sold by weight. Why are geese, ducks, and fowls not similarly dealt with? Butchers retail meat by the pound, and there is no reasonable cause why all poultry, live or dressed, and eggs cannot be dealt in likewise. If eggs were sold by weight the producer of large and good quality eggs will have satisfaction in receiving proper benefits for extra attention and feeding, and be encouraged to continue, while the man will markets small eggs would be encouraged to improve the stock he has, and follow the methods of more successful producers. Storekeepers may first object to the introduction of the system; but I think their objection could soon be overcome. The storekeeper or hawker can readily grade the eggs, and better results would accrue in realization, and indirectly the producer be benefited. The strong poultry associations in the city should combine to impress upon the produce salesmen the necessity and advantages in realization of poultry products, as mentioned, and I think it only requires the approval of the wholesale salesmen to accomplish the desirable result. Denmark and other large producing countries buy and sell the poultry products by weight, and give satisfaction and fair value to both buyers and sellers. I trust that all Agricultural Bureaux will consider this matter, and combine to bring pressure to bear in the proper quarters to bring a more satisfactory state of things about.

Pyap, August 13.

Present—Messrs. W. C. Rogers (chair), E. Robinson, G. F. Napier, J. Bowes, G. H. Mills, A. J. Brocklehurst, and B. T. H. Cox (Hon. Secretary).

Drying Raisins and Currants—Mr. Bowes read a short paper on this subject. Mr. Brocklehurst also gave his experience in drying fruit. It was not advisable to leave the fruit on the vine until too ripe, as if this were done it was not possible to produce the fine amber coloured sample desired. In sulphuring, he suggested using tar instead of oil on the sulphur frame, which should always be provided with a venthole to facilitate ignition. When the sulphur is ignited the hole should be closed at once. Fruit should not be exposed to the sun for too long a time; when nearly dry stack the trays on the drying ground, as by this method a more pliable sample is produced. He favoured the Pennant Hill apricot for drying and for carrying, and would prune them in much the same way as the peach.

Cradock, August 16.

Present—Messrs. R. Ruddock (chair), P. Gillick, A. N. Graham, H. Haggerty, W. J. Glasson, W. Symons, A. E. Clarke, J. Turner, and J. H. Lindo (Hon. Secretary).

Season—The Chairman remarked on the deplorable condition of the district. It was admitted that the weather of the next week or ten days would decide whether they were to experience another failure. The question of allowing the branch to go into recess for a time until things improved was discussed, but it was decided to leave the matter in the Hon. Secretary's hands.

Saddleworth, August 16.

Present—Messrs. J. H. Frost (chair), D. H. Adams, G. Benger, J. P. Daley, W. Hannaford, W. E. Leeder, F. Plant, F. Plueckhalm, J. Scales, F. Waddy, and F. Coleman (Hon. Secretary).

Short and long Strains of Fencing—One member asked why the wires in short strains could not be kept as tight as in longer ones. It was thought to be due to the giving back or slackening of the wires at the strainers, and to overstretching and consequently weakening of the wires in a short strain. Strain lengths of about 5 chains are usually adopted.

Cultivation of Fallow—Shallow cultivation was generally favoured. Some cultivate deeper the second time, and go in about 3 inches to kill well rooted weeds. For working fallow the ordinary, or the Schrapel, or Traeger scarifier is favoured; for shallow cultivation rather than cleaning fallow the American spring tooth cultivators have proved useful.

Salt for Cattle—Rock salt was strongly approved, also a mixture of 20 lb. salt, ½ lb. sulphate of iron, and 20 lb. bonemeal in a trough for the stock to lick when they choose. This tonic will prevent cattle becoming stiff in the joints. Mr. Plueckhalm found that ordinary domestic salt sprinkled on the hay in layers when being stocked improved the hay.

Murray Bridge, August 15.

Present—Messrs. R. Edwards (chair), W. Schubert, J. Cowan, Heinrich Schubert, W. Wundersitz, B. T. E. Jaensch, J. G. Neumann, Herman Schubert, W. Lehmann (Hon. Secretary), and two visitors.

Reclaiming Swamp Lands—Discussion took place on question of reclamation of the local commonage swamp. Members are greatly impressed with the results secured by Messrs. Morphett at Woods Point, and a motion favouring the local District Council raising money to reclaim the swamp under the control was moved by Mr. W. Schubert. It was stated that £300 would complete an embankment already started and would reclaim a considerable area of land which could be let out in small blocks. Objections were raised by some members to the proposal, and the motion was carried by a majority of

Koolunga, August 14.

Present—Messrs. T. B. Butcher (chair), J. Button, J. Sandow, G. Jose, J. W. Atkinson, W. T. Cooper, W. Aunger, T. Freeman, J. Butterfield, R. Lawry, J. Pengilly, J. C. Noack (Hon. Secretary), and one visitor.

Quesion Box Night—Q. Is it possible to exterminate fowl tick from a poultry yard? A. Yes, by burning roosts and other infested material. The tick can be kept in check by various means. Q. What can be done to increase the interest of our meetings? A. Draw up a programme for some months in advance and have a paper or special subject for discussion at each meeting. Q. What will cure sore teats in cows? A. Lard and oil, vaseline, bluestone and lard, brandy and lard applied to the sores. Q. Effect of drilling manure first and broadcasting seed afterwards? A. Many thought the wheat would not reap so much benefit from the manure as if both were drilled in together. One member thought there would be less danger of the seed malting. Q. The opinion of members of wood ashes as condition powder for stock? A. Not tried; will Editor answer. [Study the Journal; there have been several references lately to the value of wood ashes and charcoal for stock, especially pigs.—Ed.] Q. What is the right time to top gumtrees? A. July or August. Q. Which is better, shallow or deep ploughing to clean the land? A. Shallow ploughing. Q. In what state is the poison weed most deadly to sheep and cattle? A. When nearly ripe berries are on the plants it will kill in a few hours. Instances were cited to prove this. Q. Is there a known remedy for the poison weed? [What is this poison weed? In different districts different plants are called "Poison weed."—Ed.] Q. What class of draught horse is most suitable for all purposes on the farm? There was considerable difference of opinion on this point. For general purpose a medium or moderately heavy draught was preferred; the heavy draught being condemned for this district. Q. Is it desirable to licence or tax stallions? A. Members were of opinion that licensing was scarcely workable and would not tend to improve the breed of horses.

Caltowie, August 18.

Present—Messrs. N. Hewett (chair), J. G. Lehmann, J. A. Both, C. Jettner, L. Graham, J. Potter, A. Kerr, A. McCallum, J. McCallum, A. McDonald, G. Petatz, and F. Lehmann (Hon. Secretary).

Woolclassing—A class is being formed in this district under the auspices of the Bureau, Mr. Geo. Jeffrey, Wool Instructor to the School of Mines, taking charge.

Bureau Meetings—Mr. Hewitt called attention to proposal of Port Pirie Branch that postcard notices should be omitted, and a regular programme of meetings drawn up instead. He did not think the proposal would work satisfactorily. Mr. McDonald thought the postcards almost a necessary reminder of date meetings and subject for discussion. It was suggested that members should be bound to attend at least six meetings during the year; also that if any member, absent from one meeting without valid excuse should not be present at the next, his name should be struck off the roll.

Wilson, August 16.

Present—Messrs. W. H. Neal (chair), T. Barnes, W. H. Neal, Jun., H. F. Nadebaum, J. Nelson, H. Ward, D. Sexton, A. Smith (Hon. Secretary), and one visitor.

Stock Complaints—Several questions asked through the question box were answered by the Inspector of Stock. Q. What is the cause of flow of water form a horse's mouth; occasionally there is quite a stream of water; the animals appear in good health, and the eyes are bright. A. Probably water-brash due to derangement of the digestive organ. It is exceedingly difficult to treat, and results are uncertain; a tonic consisting of a handful of a mixture of salt and sulphate of iron, (10 of salt to 1 of iron), given in the feed three times a week may be beneficial. Q. What are the usual first symptoms of water trouble in horses. A. Symptoms vary considerably; general uneasiness, and "colicy" pains are often indications of bladder troubles. Q. Some cattle in this district have rough patches on the skin; the hair comes off, and the hide is rough and ridged like a blister or blotched brand. What is the cause? A. The animals are most probably suffering from presence of minute parasites in the skin which can be got rid of by washing the affected parts daily with soft soap and water, to which a few drops of carbolic acid have been added. Members were not satisfied with the reply re "Waterbrash," and desire the experiences of other members.

Belair, August 16.

Present—Messrs. O. H. Nootnagel (chair), G. Rossini, H. Halstead, J. Halstead, W. Bartlett, and G. R. Laffer (Hon. Secretary).

Spraying for Codlin Moth—A lengthy discussion took place on this subject. Mr. Rossini stated that he intended to give spraying a thorough trial this year. Mr. Laffer considered it imperative to start spraying as soon as the petals of the flowers commenced to fall, and advised giving two sprayings within ten days, as some of the early maturing apples grew so rapidly that the calyx quickly closed. Two early sprayings were in his opinion most essential as it was not always possible to give all the fruit that will set a coating of spray the first time. Last season a row of Rome Beauty apples, one of the latest varieties to flower, only received the second and third sprayings, and there was fully four times as much infested fruit on these trees as on the trees in the rows on either side which received two early sprayings.

Closing Branch—Owing to the apathy displayed by members it was decided to close the Branch.

Angaston, August 9.

Present—Messrs. W. Sibley (chair), A. Friend, A. Sibley, F. Thorne, J. H. Snell, J. Vaughan, S. O. Smith, F. Salter, R. Player, A. Salter, and E. S. Matthews (Hon. Secretary).

Bureau Conference.—It was decided to hold a conference of Bureaux at Angaston on November 5 and 6. Members of surrounding branches are invited to assist in making the Conference a success.

Norton's Summit, August 23.

Present—Messrs. J. Jennings (chair), J. Hank, J. Pellew, Alex. Smith, C. W. Giles, and W. H. Osborne (Hon. Secretary).

Work of Branch.—Some discussion took place on the difficulty experienced in securing the attendance of members at the meetings of the Bureau, and it was decided to make an effort to reorganize. Matters were left in hands of Mr. Alex. Smith, who undertook to secure the services of gentlemen as members who would be prepared to attend the meetings and help to make the Branch a success. Messrs. J. Jennings and J. Pellew tendered their resignations, and a hearty vote of thanks was accorded to Mr. Jennings for his services since the inception of the Branch.

Crystal Brook, August 16.

Present—Messrs. J. C. Symons (chair), W. Hamlyn, A. Miell. R. Pavy. W. Hutchison. P. Pavy, G. Davidson, B. Weston, W. J. Venning, G. M. Davidson, W. Morrish. jun., and F. S. Keen (Hon. Secretary).

Officers—Messrs. R. Pavy, W. Hamlyn, and J. C. Symons were elected Chairman, Vice-Chairman. and Hon. Secretary respectively.

The Advantages of Rural Life.—Mr. J. C. Symons read a paper on this subject to the following effect:—

That there was a continued drift of population from the country to the town was one of the saddest facts of present day civilization. It was sad, because of the overwhelming evidence that it tended to the physical and moral deterioration of the race The question naturally forcing itself under their notice was, "Why are our young men migrating to the towns?" The usual answers were—Shorter hours of labour. better pay, more amusements, more variety and change, &c. Assuming that the hours are shorter and the pay higher in the city, there was no question that 10 hours work in the country was less trying than 8 hours in a shop or office; while it was equally certain that a young man could, if he choose, save 20/ in the country for every 10/ he will save in town. Against the city must also be put the less healthy conditions and greater temptations that a young man meets All those with the best interests of the country at heart must try to prevent this exodus to the towns. Show the young people the greater superiority of country life, and make the home attractive Money spent on a piano or other musical instrument is well spent Social gatherings where innocent amusements are provided should be encouraged Every effort should be made to foster the literary tastes of our young men. It was a matter for regret that many of our leading townsmen give such things as mutual improvement societies and clubs the cold shoulder. He felt that it was a pity that the Australian youth devoted so much attention to sports and physical amusements; it was not a favourable sign when thousands will rush to a cricket or football match and only a few scores to a scientific lecture. The tendency in the past to centralization had undoubtedly accentuated the evil he was dealing with; and, while it might seem like trespassing on political subjects, he could not help saying that if the Government would spend more money on well considered schemes of water conservation, so as to enable the young people to establish prosperous homes on the land, it would be much better for the country generally. The conclusion they must come to was that the future welfare of their race required that the people should get back to the land, and it will pay the State to keep the people in the country.

Considerable discussion ensued. Mr. Venning contended that when they took into consideration the cost of living and the greater temptations to spend money in the city, the wages in the country were relatively better than in town. The country could offer quite as good prospects to a young man as the town. Mr. Hamlyn agreed with Mr. Venning on this point, and urged the necessity for farmers endeavouring to make country life more attractive. Mr. R. Pavy agreed, and thought farmers should pay their children a small wage regularly. Other members spoke of the advantages of country life, and generally agreed with previous speakers as to the necessity for making greater efforts to render life on the farm attractive to the young people.

Market at Crystal Brook.—Some discussion took place on the prospects of establishing a monthly stock and produce market, but decision was adjourned until next meeting.

Bowhill, August 23.

Present—Messrs. N. P. Norman (chair), E. P. Weyland, F. H. Baker, S. Johnson, J. Waters, J. G. Whitfield (Hon. Secretary), and one visitor.

Pinnaroo.—Mr. Weyland read an interesting account of three visits he had paid to what is known as the Pinnaroo district. He was thoroughly satisfied that there were large areas of land in this locality well fitted for agriculture and grazing. Much of the land was heavier and better than the scrub lands near the river. The timber on the whole was heavier, and although he had seen reference made to its inferior appearance, he thought this was due to the fact that bush fires had been frequent. After a careful examination of the district he believed that the estimated area of four to five hundred thousand acres suitable for agriculture and grazing was not an exaggerated one. With a railway he was convinced that a large number of farmers would secure satisfactory results from their work.

Mallala, August 22.

Present—Messrs. G. Marshman (chair), W. Temby, S. Temby, J. Jenkins, A. F. Wilson, J. McCabe, A. Moody, T. Nevin, and two visitors.

Horsebreeding.—Mr. Nevin read article from Journal of Agriculture on this subject. Members were of opinion that stallions should be examined for soundness, and not allowed to serve mares unless they pass the examination. Mr. McCabe thought that sufficient attention was not given to the young foals. They should be well fed with bran and other nourishing food before being weaned. It was a common practice to turn out young foals on to dry feed too early, the result being they suffered from worms and sand, and got stunted. Mr. Churches thought all stallions should be required to pass a veterinary examination; an annual licence fee of £10 would improve the class of stallions travelling. Mr. Temby reported that milk had been running from one of his mares for quite a month, but she had not yet foaled. She was apparently quite healthy, and feeds well. This was her first foal.

Quorn, August 16.

Present—Mr. R. Thompson, J. P. (chair), Messrs. J. B. Rowe, J. Cook, F. Herde, J. Brewster, W. Toll, G. Walker, J. W. Smith, and A. F. Noll (Hon. Secretary).

Rainmaking.—Mr. Rowe had read an account from a Sydney paper of an interview with Mr. Wragge on the possibility of inducing fall of rain by shooting with Stiger Vortex guns.

The Vegetable Garden.—Mr. Walker read the following paper on this subject:—

"The Vegetable Garden an Essential on every Well-regulated Farm.—It must be distinctly understood that in the remarks and suggestions in this short paper there is no idea of growing vegetables for market, but never let your surplus go to waste, I have often sold a few when the crop had matured quicker than required for home use. Always have your garden as near to your house as possible, because you can then put your spare minutes in with the hoe at any time. From my own experience I can say that from 20 to 30 minutes' work with my garden fork or hoe is a splendid sauce to sit down to breakfast with; and, therefore, we can find a relish for our meat by working in the garden, and the very work that creates or gives the appetite, provides something to satisfy it with. Do not have your garden too large, unless you have an abundance of water, a small plot, well attended to, will produce sufficient for any ordinary household. Choose a low-lying piece of land, where you can get the water to run to; break the ground up to a good depth, adding plenty of stable manure (a little of the artificial fertilizers, suited to the plants you want to grow, will push the crop along). Vegetables, to be A1, must be grown quickly, a continuous growth must be kept up, for a check, for want of attention with waterpot or hoe, is often disastrous to the crop, for then, I believe, it is that the pest so prevalent in gardens—blight—takes possession, sometimes nullifying all labour expended. Securely fence the ground, sink a hole on the highest end with sloping sides, run out plough furrows to carry in the water from the greatest area the locality will allow of; have it so arranged that when the water hole is full the surplus will flood your garden, leaving the water in the hole for after use. I know several persons who follow a similar practice to the above, and they have had an abundance of vegetables throughout all these dry years. I can recommend the following for a dry spell:—After you get your plants established hoe well around them, take your fencing bar and make a hole, from 9 to 12 in. deep, a little way from each plant; by so doing the loosened soil acts as a mulch, and the water being poured in the holes the growing plant receives the full benefit with comparatively no evaporation, because of no baked surface; baked surface means stunted plants, a disgusted owner of a disgusting crop. The fact that the medicinal value of plenty of vegetables far outstrips their money value should be a great incentive to every farmer to have his vegetable plot. I might say a great deal as to what to plant, the time to plant, and the modes of cultivation, but that is needless, as an illustrated catalogue giving all such information can be obtained from any seedsman."

Considerable discussion ensued, some members doubting the possibility of growing vegetables satisfactorily where they were dependent on such a limited rainfall. Mr. Rowe stated that for the past three months he had been cutting cabbages, but the plants had not to depend solely on the natural rainfall. He cut gutters along the slope of the garden from the catchment, and set the plants in these gutters, and allowed the water to run along them. Whenever he cut a cabbage he took out the stump and set a fresh plant. It was not possible to grow vegetables with only the natural fall in such seasons as the present. Mr. Cook also grew vegetables; he did not look so much at the actual cost of growing them as from the health point of view. When properly treated, a great deal of labour was involved, but comparatively little water. Some of the members stated that with average seasons they could produce a fair quantity of vegetables, but the last few years had been so dry that it was quite out of the question.

Journal of Agriculture.—The Chairman recommended members to study The Journal carefully, as he would like them to come prepared to comment on the new issue at next meeting. [Very good idea.—Ed.]

Boothby, August —.

Present—Messrs. J. T. Whyte (chair), J. Bell, R. Chaplin, A. Henderson, W. B. McEwan, J. A. Foulds, H. S. Robinson, A. A. Turnbull (Hon. Secretary), and two visitors.

Best Wheats.—Mr. Bell initiated a discussion on the best wheats to grow in this district. He considered Dart's Imperial one of the best, Rattling Jack, White Tuscan, and Purple Straw also being suitable. All these should be put in as early as possible, as they are slow growers. Petatz Surprise was a very good early wheat. He had a cross between Rattling Jack and Velvet Pearl, which he thought might prove of value here.

Season.—The rainfall recorded for seven months has been 6.25 in. Feed is very scarce, and stock are falling off in condition. Unless good rain falls early, it is doubtful whether many of the crops will produce seed.

Mount Bryan East, August 16.

Present—Messrs. A. Pohlner (chair), W. Bryce, B. H. Dunstan, G. Taylor, T. Wilks, J. Wilks, E. S. Wilks, and J. Honan (Hon. Secretary).

Glanders.—Mr. Dunstan wished to know if glanders was a common complaint of horses in Australia, and if the disease was contagious. [No authenticated case of glanders has been recorded in Australia. This disease is very infectious to man and beast, and is regarded as incurable.—Ed.]

Farming.—Some discussion took place on the cultivation of the land. The Chairman contended that it was more profitable to sow newly ploughed land than fallow, as the extra feed obtained when land is not fallowed more than made up for any deficiency in the crop. The majority of the members were, however, in favour of fallowing. Members reported that the steady rains of the past week, though recording only about one-third of an inch, had put fresh vigour into the crops and grass, which were beginning to look very sickly, owing to the long spell of dry weather.

Renmark, August 21.

Present—Messrs. E. Taylor (chair), F. S. Wyllie, W. J. Moffat, M. B. Geneste, J. A. Forde, and F. Cole (Hon. Secretary).

Uses of Lime.—The Chairman read paper from Journal of Agriculture on the application of lime, as read by Mr. Malpas at Mount Compass Branch. Some discussion ensued, and Mr. Forde expressed the opinion that lime would not act beneficially on most Renmark soils, as there was an abundance of limestone in the lower layers of the soil. [The presence of limestone in the subsoil is not by any means proof that the application of quicklime would not be beneficial.—Ed.]

Kanmantoo, August 14.

Present—Messrs. T. Hair, J.P. (chair), J. Mullins, P. Lewis, T. Hawthorne, F. Lehmann, W. G. Mills, and F. Lehmann (Hon. Secretary).

Pigs.—Mr. W. G. Mills read a paper on this subject to the following effect:—

The pig is aptly described by the Irishman as the gentleman that pays the rent He proposed to show that not only could he be made to pay the rent on a small farm, but also to manure and cultivate a part of such farm. To make use of the pig's well-known propensity for rooting up the ground he would have movable styes on wheels—wooden wheels, not more than 1 ft. in diameter being preferable. The stye should be properly roofed with galvanized iron, the floor boarded, and a hinged door, bolting outside, provided. A number of pig-proof hurdles will also be required; for a few pigs three good hurdles will suffice, but the more you can provide the better. A trough or two for feeding purposes will also be required Now, to cultivate your garden, drive the pig into the sty, bolt the door, and wheel it to the place you want broken up; put up the hurdles, and let the pig out. When he has cultivated the ground inside the hurdle pen him up and shift quarters again. In this way the garden, lucerne patch, or mangolds, peas, or other green stuff, can be utilized to the best advantage. With the addition of a little corn and slops the pig will quickly make good bacon. By this plan the land is broken up and manured, the crop gathered without any trouble, there is no smell or unpleasantness about the pig, and there is a decided profit from the animal. He believed it possible to adopt this principle on a small farm with a number of pigs and with better results than the usual style. Pigs kept in a fixed sty or small yard in the winter get very dirty, the surroundings are apt to become offensive, and one does not care to have anything to do with them. On the other hand, if allowed at large on a small farm they are always up to some mischief; it may be the garden, the crop, or the haystack that suffers, to say nothing of eggs and other things they will eat. The Berkshire was the breed most generally favoured in this district, and there was no question that this preference was justified. He makes good bacon, is hardy, grows quickly, and is as good a "rooter" as any other While feed was an important item, there was no getting away from the fact that all your feeding will not convert a mongrel into a well-bred animal. The pig must be well fed, or he will not pay. There was no doubt that their climate and country was well suited for pigbreeding, and the amount of profit derivable from pigs will to a very large extent be in proportion to the amount of feed the farmer can grow or buy for them. They had bacon factories and buyers at their doors, and he was confident they could increase the production of pork products one hundredfold.

A lengthy discussion ensued. Mr. Mills was of opinion that pig-breeding and fattening for bacon curing should not be combined by the one man, but members differed on this point. In discussing the protection of the young pigs at farrowing time, Mr. Hair, stated that he always ran a bar on the inside of the sty, a little distance from the wall on the three sides; this provided a means of escape for the young ones. He had noticed that the mother usually killed the young pigs by jamming them against the walls of the sty.

Hartley, August 15.

Present—Messrs. W. Klenke (chair), J. Stanton, A. Jaensch, W. Brook, J. Jaensch, W. Kutzer, T. Jaensch, A. Stein, B. Wundersitz (Hon. Secretary).

Cultivation of Mangolds.—Discussion on this subject took place. Mangolds were considered a profitable crop to grow where there is a fair rainfall and suitable soil. They were excellent for pigs as well as for milk cows. The land should be deeply worked, thoroughly pulverized, and made as level as possible. Mr. Stanton stated that on land that had been flooded he had grown mangolds 4 ft. in length; 3 lb. of seed per acre was sufficient to sow. They would do well on land too salt for wheat.

Officers.—The retiring officers were thanked for their services. Messrs. W. Klenke, W. Brook, and A. Stein were elected Chairman, Vice-Chairman and Hon. Secretary respectively for ensuing year.

Dates of Meetings.—Members did not approve of publication of dates of meetings in the Journal, as when meeting is held during the first week of the month the members do not receive the Journals in time. They thought it would be better to publish dates of meetings for the year, and only in one issue of the Journal. [This can be discussed at Officers' Conference.—Ed.]

Carrieton, August 21.

Present — Messrs. W. J. Gleeson (chair), M. Manning, O. Hall, J. W. Cogan, G. Martin, J. W. Bock (Hon. Secretary).

Business.—The Chairman gave a short report on the work done by the Branch during the past year. The severity of the past few seasons had been exceptionally trying to all, and the work of the Branch had naturally been hampered. He hoped, however, that with a return of better seasons they would be able to do more than of late. Messrs. Gleeson and Bock were thanked for their services, and re-elected Chairman and Hon. Secretary respectively.

Davenport, August 14.

Present—Messrs. W. J. Thembath (chair), F. H. Pybus, J. Tottman, T. McDowell, F. B. Rathbone, W. Hodshon, sen., D. J. Magrath, J. E. Lecky (Hon. Secretary) and one visitor.

Farm Buildings.—Mr. Trotman read a paper on this subject:—

> I would suggest making a shed, 40 feet by 20 feet, for housing implements and vehicles, with forked posts and round rails, and roofed with brush and straw. For a shed of the above dimensions 12 forked posts 11 feet long, and six 12 feet long, will be required; put one row of six posts, divided into 8 ft bays, on each side, and one row of six, divided the same way, down the centre; place them 2 ft. 6 in in the ground. The centre row being one foot higher than the outer lines of posts gives the roof a slope to each side. The rails require to be 9 ft long, eight of them for the top. Place them in the forks of the posts and then tie with wire to keep them together, and around the forks so they cannot lift up or move out. The roof rails would require to be 11 ft. in length. Place one at each side of the ends, and one at each post at each side, tieing them together at top and bottom Place three between each bay, on each side, making 20 in all, tieing them with wire as in the former case. Place brushwood all over the roof rails on each side, and then cover with straw to the thickness of 18 in. After you have got the straw on put some wire over lengthways across. To make the walls on each end and one side put wires in from corner to corner, and then lace brush through them Always have the open side facing the south-east to prevent the sun shining in on the implements. If the forked posts and rails are not procurable in the district, and you have to make a shed of sawn timber, I would suggest the following course:—Procure some gum or jarrah timber, or myall posts, about 5 ft. long. Place them in the ground 2 ft. 6 in., the size you intend to make your shed, having the bays 9 ft apart, or thereabout. Then bolt 4 x 3 hardwood on to them, 8 ft. long, and cut out 1 in. by 4 in. at the top to take the top rail, which will be 4 x 3 hard wood on each side. The centre row will require to be 10 ft. long, so as to give the slope for the roof. Bolt them on to each post at the top. The rafters to be 4 x 3 cut down level on the plates at the centre and the sides; one at each side at each post. The purlins to be 3 x 2 soft wood, one at the top and bottom, and one at the bottom of the top sheet of iron, and one between each sheet to carry the iron for the roof. The sides and ends of the shed have two soft wood rails, one at the bottom and centre, 3 x 2; the top plate making the third one to take the iron for the walls, you can make one bay wide enough to take in a wagon or a binder, and then it will be wide enough to take a spring dray.'

An interesting discussion took place, special reference being made to the careless way in which farmers generally, and in the Northern areas in particular, look after their implements and machinery, and the want of care shown in respect to the provision of shelter for stock.

Drought-resisting Wheats.—Mr. Penna forwarded newspaper clipping concerning experiments being conducted in the United States of America, with wheat from the semi-arid regions of Russia and Asia. The wheats are very hardy and are spoken highly of. Members would be glad if the Department of Agriculture would procure some for trial in this State. [Seeds of several of these wheats were obtained some months ago, and are being tried in several localities. Except for feed for stock or for crossing with a view to improving our wheats it is difficult to see what we can do with them under our present conditions. As to their drought resistance, the report quoted states that these wheats come from districts where the rainfall averages 15 inches to 17 inches per annum, two-thirds of which falls in the winter months; such conditions of rainfall compare only too favourably with most of our wheat-growing areas. The samples we have seen were hard, dark, flinty grains, and the majority are dark bearded winter wheats.—Ed.]

Appila-Yarrowie, August 13.

Present—Messrs. J. C. W. Keller (chair), W. C. Francis, J. H. Bottrall, P. Lawson, A. Fox, J. Wilsdon, N. Hannagan, R. H. Grant, J. H. Klemm, G. A. A. Becker, J. Daly, and C. G. F. Bauer (Hon. Secretary).

Death of Member.—Feeling reference was made to the late Mr. C. W. H. Hirsch, who had been an active member of the Branch for many years.

Seed Wheat.—Mr. Grant read a paper on preparing seed wheat to the following effect:—

Farmers should pay more attention to the seed they sow. Change of seed was beneficial. The suitability of certain wheats for certain kinds of soil must be studied. The question of freedom from bunt was of the greatest importance. Pickling with bluestone was an effective preventive of this trouble. Still we hear of numbers of farmers who pickle their seed and yet lose heavily from bunt. He could not account for this unless it was due to some mistake, or to carelessness in pickling. With the advent of the seed drill it was imperative that the pickling is done thoroughly, as the bunt balls will break in the drill; if possible they should be taken out when pickling the seed. Bunted seed should be pickled with a strong solution of bluestone, and to make up for the wheat that will be destroyed he sowed it thicker. He preferred dipping the seed. With a hole in the floor, cemented to make it watertight, and a lever to lower and raise the bags of wheat, one man can pickle a hundred bags of seed in a day without being overworked. This was very different from the method of pickling on the floor for ease and quickness. A cup of bluestone will make enough pickle for 12 bushels of seed; the bags containing the seed should not be quite full, and should remain under the surface until all bubbling ceases. The seed should be pickled several days before sowing, or it will run badly in the drill. At harvest time the wheat for seed should be carefully selected and stripped when the weather is not too hot, otherwise a lot of the grain will be damaged. The wheat should be thoroughly ripe, as free as possible from weeds, and of one variety. Clean the seed over an open screen to remove small seeds, cracked grain, &c. He thought they should sow the seed very shallow, so long as it was covered with soil it was sufficient. He believed hundreds of bushels of wheat were lost in this district, this year and last, through being drilled too deeply.

Mr. Lawson said that farmers pickling in a tub or cask could not be too careful, often water was added to the pickle to replace that soaked up by the bags and the seed, the consequence being the pickle got too weak. Mr Hannagan said he pickled strongly wheat sown with the drill; seed sown dry required a weaker solution than that sown after rain.

Wilmington, August 20.

Present Messrs. Wm. Slee (chair), Cole, Hannigan, Schuppan, Bauer, Lauterbach, Bischof, Sullivan, McLeod, Broadbent, and Hon. Secretary.

Manures.—Discussion took place on the lasting effects of manures. Members who had used Thomas phosphate were unanimous that while slower in its action than some manures its benefit was more apparent the second year. The Hon. Secretary, stated that where he had applied Thomas phosphate to potatoes last year the growth of weeds this season was very much greater than elsewhere.

Wooden v. Iron Fences.—Discussion took place on report in August issue from Ardrossan Bureau. Members were generally of opinion that where good timber was plentiful, wooden posts were preferable, and during a length of time less expensive. It was admitted that where good lasting timber was scarce iron posts were decidedly the most economical.

Colic in Horses.—Discussion took place on best treatment for colic or gripes. Two remedies were suggested; the first was to dissolve a lump of saltpetre about the size of a shilling, in hot water, then add to a strong dose of brandy or whisky; give this to the horse and rub his sides well with whisps of hay or straw. The second remedy mentioned was half a bottle of Burke oil given as a drench; if not effective within eight or ten hours repeat the dose.

Bacon Factory.—Mr. Lauterbach read a short paper in which he strongly advocated the establishment of a bacon curing factory in this district. He pointed out that in a large dairying and wheat growing district there was plenty of skim milk obtainable from the butter factory, while every farmer had a certain amount of small and inferior grain to dispose of. These could be profitably utilised in the feeding of pigs. Pig breeding was profitable, and quick returns were almost ensured. The factory-cured bacon almost invariably fetched highest prices. He thought it would pay the farmers well to establish a co-operative bacon-curing factory. Members generally agreed that with a return of good seasons such a factory would be profitable. Considerable discussion took place on the superiority of the Berkshire pig for bacon, a fact which was generally admitted. Some members were doubtful whether a breeder of Berkshire would get any more for his pigs at a factory than for ordinary crossbreds.

Officers Conference.—Members heartily supported the proposal to hold a conference of officers of Country Bureaux in connection with the Annual Congress, and believed much good would result.

Season.—Feed is very scarce, and the wheat plant backward, but fairly healthy. Frosts have been very severe, but nice rains were recorded about August 18, and more is promising.

Booleroo Centre, August 15.

Present—Messrs. W. H. Nottle (chair), N. Clack, J. Albinus, J. H. Repper, J. Clack, J. Murdoch, G. Sargent, W. Brooks, J. Arthur, J. Michael, Dr. Steven, S. T. Parsons, F. McMartin (Hon. Secretary), and five visitors.

Plant Food.—Dr. Steven read a very interesting paper on this subject. He described the action of the sun, wind, and air in disintegrating and making available for plants the foods in the soil; the manner in which the roots of the plant absorbed the food in solution; the various constituents of plants and sources from which they were derived. The actions of the chief constituents of the soil were described, and the necessity for studying the soil and the requirements of the individual crops emphasized. Dr. Steven pointed out how some constituents required by the plants may in time be used up, and notwithstanding its richness in other constituents it was impossible for such impoverished soils to yield good crops. Up to the present their soils had shown the need for phosphoric acid, but as time went on it was almost certain the farmer would require to add nitrogen or potash, or both. Lime might also on some soils be necessary, but generally speaking it was only the three first-mentioned constituents that were likely to become deficient. There was no question but that the farmer must practise scientific methods of cultivation, and the more he can learn about the treatment of the soil and the requirements of the plants under varying conditions the better will he be fitted to make a success of his operations. Considerable discussion ensued members greatly appreciating the doctor's explanations. The Chairman thought as farmers they required more knowledge of the requirements of plants. He was satisfied that the best money he had spent on his farm was the amount laid out for seed and fertiliser, drill and manure. Mr. Clack was satisfied that his outlay in this direction was more than repaid the first season. In reply to question Dr. Steven said if manure was put into the soil and no crop grew owing to lack of moisture it would not be lost, but would be available for the following crop.

Port Germein, August 16.

Present—Messrs. G. Stone (chair), H. Kingcome, W. Mortess, C. O'Loughlin, J. K. Deer, F. Smith, D. Thomson, A. H. Thomas, E. G. Bleising, W. T. Harvey, W. Head, G. F. Steinthal (Hon. Secretary), and one visitor.

Annual Report.—Average attendance of members during the year has been eight. Four interesting papers had been read, and generally the meetings have been instructive. It was decided that delegates bring before the Annual Congress the question of the Government experts visiting the country Bureaux oftener than at present.

Dairy Cows.—Mr. Kingcome read an interesting paper on this subject, dealing with the breeding and management of dairy cattle, which it was decided to ask the Secretary for Agriculture to place on the Congress agenda paper.

Morgan, August 16.

Present—Messrs. R. Windebank (chair), H. Hahn, G. Wittwer, H. Wohling, H. H. Plummer, E. Hausler, J. Bruhn, F. R. Haupt, and W. G. F. Plummer (Hon Secretary).

Season—Mr. Windebank tabled sample of wheat that had been in the ground for several months, but owing to the dry weather and absence ot moisture in the soil it had not even germinated.

Buck Tooth.—Mr. Hausler stated that the tooth he referred to as buck tooth in a horse's jaw was one of the molars which grows outwards and longer than the others, to the discomfort of the horse.

Valuing Land.—Considerable discussion took place on the question of the proper method of valuing land for agricultural purposes. It was admitted that a man from another locality could not put a fair value on the land, as he would be influenced by the condition of affairs at the time he saw the land. The season might be above or below the average. One member contended that it was impossible to put a fair value on their land except on the average production of twenty years. Some discussion took place on the relative merits of different classes of soil, and on the returns obtained during late years. Members generally considered that if they could always depend on reaping at least three bushels per acre of wheat they could make a living, but on an average of three bushels it was impossible.

Straw Chaff for Stock.—M. Wittwer found that old straw chaffed was better for stock than new straw or coarse grown straw. It should be chaffed shorter than half an inch and mixed with bran and pollard for feeding. Only a little should be fed at first, gradually increasing the quantity as the animals got used to it. The chaff should be first put through the winnower to clean it from dust and other matter. If possible, a little good hay should also be given each day. Mr. Hausler had also noticed that stock were fonder of old straw than new, and would eat the straw from an old stack sooner than the stubble in a newly stripped field.

Yorketown, August 9.

Present—Messrs. B. Lloyd (chair), D. Jung, C. Domaschenz, J. Latty, J. Davey, A. Anderson, S. Vanstone, C. H. Davey, J. Koth, J. Thomas, and R. Newbold (Hon. Secretary).

Manuring Grass Lands.—Mr. J. Davey reported on experiment with mineral super applied as a top dressing to grass land in June. One acre had received 2 cwt. per acre, and two acres received at rate of 1 cwt. per acre. Up to the present he could see no benefit from the manure. Members thought that the manure should have been applied earlier; also that the dry weather had affected the test.

Salty Soil.—Mr. Domaschenz reported that he was carrying out some experiments with a view to utilizing lands rendered useless for cropping by the rise of salt.

Wandearah, August 18.

Present—Messrs. E. H. Eagle (chair), L. Stanley, N. Roberts, W. Munday, T. Joyce, W. Davidson, J. Kurll, G. Collins, and C. Birks (Hon. Secretary.

Feeding Off Wheat Crops.—Discussion took place on this subject. Some members were of opinion that the wheat was improved in vigour by feeding off with sheep, but care must be taken that the stock are not left on too long.

Deep v. Shallow Seeding.—This question was discussed. Members generally were of opinion that it was preferable on the whole to sow at a medium depth. Deep sowing caused the plant to throw out a second crown of roots near the surface, showing that the grain was covered too deeply. It was thought that wheat sown too deep was more affected by the spells of dry weather early in the season.

Lipson, August 16.

Present—Messrs. S. F. Potter (chair), E. D. Swaffer, C. Provis, G. Provis, J. McCallum, Caleb Provis, J. Brown, E. J. Barraud (Hon. Secretary), and one visitor.

Manures.—Reference was made to a statement in the press by a recent visitor concerning the use of manure in this locality. The gentleman in question had said that in Port Lincoln district local guano produced a good crop of grass after wheat had been grown, whereas super caused the very opposite result. Members challenged this statement, and were unanimous that the result of a good dressing of super to the wheat crop was plainly seen for several years in the improvement of the grass.

Scour in Horses.—Mr. Brown asked for remedy for this complaint. [Remove the cause; possibly rusty hay or some undesirable weed. Change the feed, and give a little pollard.—Ed.]

Disc Drills.—Several members thought that while these drills would be very useful on stubble land, there was considerable risk of breakage on stony soil.

Wheat Crops Dying.—The Hon. Secretary stated that on some of his land the crops were failing. After being above ground for about a month, the plant gradually changed colour in patches, the flag becoming lighter and having a striped appearance, there being two shades of green. Later on the plants wither at the top and go back considerably, showing large yellow patches in the field. He would like to know what was the cause, and whether anything could be done to improve the crop.

Feed for Stock. Mr. Charles Provis read a short paper on this subject. It was a mistake for any stockowner to think that the land at any time carries too much feed, as any surplus over immediate requirements can and should be preserved for future needs. He had seen heaps of cocky chaff left in the field to be eaten or trampled under foot by stock. With a little trouble the chaff can be preserved for years. If shed room is not available, put the heap together, make a good covering with straw, and put a fence round to keep stock out. Rake up any straw available and stack it. This chaffed and fed with hay will make the hay go further. This or chaffed hay and cocky chaff makes very fair food for stock. He had known sheep kept fat on good, clean straw.

Riverton, August 16.

Present—Messrs. H. A. Hussey (chair, and Hon. Secretary), W. Hannaford, Dr. Glynn, D. Kirk, R. H. Cooper, T. Gravestocks, W. J. Kelly, A. J. Davis, W. B. Davis, and three visitors.

Licensing Stallions.—It was unanimously resolved—"That this branch is strongly in favour of the licensing of all stallions, and that the Government should offer some inducement to the introduction of high-class draught stock, preferably Suffolk Punch horses."

Pleuro.—Dr. Glynn read lengthy paper published some years ago dealing with the causes and symptoms of pleuro-pneumonia. The symptoms of the disease are as follows.—In milch cows the attention is first drawn to the diminished quantity of the secretion, and on examination the udder is found to be tender and flaccid; rumination is irregular or altogther suspended. The extremities are sometimes hot and sometimes cold, breathing laboured; pulse beats rapidly from 70 to 80. The temperature ranges from 104 deg. to 109 deg. Fahr.; constant cough with occasional shivering fits. There is a low grunt on expiration of the air from the lungs, and tenderness on pressing the hand on the back along the spine. The cough becomes painful and frequent, and decided pain is evinced on pressing the intercostle spaces (between the ribs). The animal stands with the nose protruded; the spasmodic abdominal breathing becomes plain, the nostrils expanding and contracting with every inspiration and expiration. There is a discharge from the eyes and nose, the elbows turn out, and altogether the animal has a distressed appearance, which with the difficult breathing is characteristic of the disease. There is also every symptom of fever. On auscultation in the early stages a loud rasping sound will be heard in the windpipe and bronchial regions, caused by the hurried breathing over an irritated and non-secreting surface. It can at first be heard in the affected lung, but gradually becomes lost either from consolidation or effusion into the chest or both. Frequently only one lung is affected, and when this is the case careful comparison of the sides will enable the advance of the disease to be followed, and will assist in distinguishing between pleuro-pneumonia, epizootica, and sporadic pleuro. In the latter there are not the bronchial symptons, and both lungs are affected, while the animal never exhibits the same distressed appearances. On the healthy side in pleuro-pneumonia the respiratory murmur and resonant sounds can be heard, while on the other there is no murmur, and the dull sound on percussion indicates what has taken place. Dr. Glynn stated that there was considerable difference between ordinary pneumonia and pleuro-pneumonia. Farmers and others should make themselves acquainted with the sounds of healthy breathing of stock; this could be done by occasionally listening at the side of a beast. Sometimes with pleuro only one lung was affected, and amateurs were liable to be deceived. Mr. W. Hannaford said he had a considerable experience with pleuro cattle in Queensland, where they found innoculation successful.

Mundoora, August 15.

Present—Messrs. R. Harris (chair), W. J. Shearer, C. Button, W. Aitchison F. X. Beck, D. Owen, W. Mitchell, and A. E. Gardiner (Hon. Secretary).

Farming, Past and Present.—Discussion took place on this subject. The younger members of the Branch thought that the difficulties of present-day farming were fully as great as what their fathers had to contend against, but the Chairman pointed out a few advantages in the way of improved implements and means of communication, facilities for watering stock, and in other directions, which the present-day farmer possessed. Farming in the early days was very different.

Lucindale, August 23.

Present Messrs. S. Tavender (chair), A. Carmichael, A. Matheson, J. McInnes, H. Langberg, W. Dow, E. E. Dutton (Hon. Secretary), and three visitors.

Codlin Moth.—Mr. Langberg tendered his resignation as Honorary Inspector of fruit. Members expressed their dissatisfaction with the working of the Act as regards codlin moth, and none of them would agree to act in Mr. Langberg's place. It was stated that, while this district was still free of the pest, it was rampant round Narracoorte.

Grass Grubs.—Mr. Langberg tabled specimens of white grubs, which eat the roots of grass.

Redhill, August 19.

Present—Messrs. D. Lithgow (chair), T. H. Torr, R. H. Siviour, A. A. Robertson, A. E. Ladyman, S. H. Treloar, D. Steele, and J. N. Lithgow (Hon Secretary).

Annual Report.—Nine meetings held during the year, with an average attendance of 8.7 members and 6 visitors. Messrs. R. H. Siviour, W. Stone, and J. N. Lithgow were elected Chairman, Vice-Chairman, and Hon. Secretary respectively.

Feeding Off and Harrowing Growing Crops.—Discussion on these practices took place. Some members had experimented with success, while others had been failures. It was agreed that the result was to a large extent dependent upon the weather. Best results were obtained when rain came soon after the crops had been fed off or harrowed.

Golden Grove, August 14.

Present—Messrs. R. Smith (chair), W. Bartle, J. R. Smart, A. Harper, J. Ross, A. Robertson, J. McEwen, F. Buder, W. Mountstephen, J. Rawlins, J. Woodhead, C. Angove, S. A. Milne, and J. R. Coles (Hon. Secretary).

Bare Fallow.—Members are of opinion that the Hon. Secretary made an error in report of previous meeting in stating that bare fallow was condemned in this district.

Superphosphate. Mr. C. Angove read an interesting paper describing the action of superphosphate, and the process by which the insoluble rock or bone phosphates are converted into the water-soluble phosphate, which was the main constituent of superphosphate.

Reeves Plains, August 15.

Present—Messrs. W. H. George (chair), H. Day, W. Day, R. H. Oliver, H J. Worfel, P. Marshall, W. S. Corden, A. Arnold, E. Hancock, J. J. McCord (Hon. Secretary), and several visitors.

Chemical Manures.—The Chairman read a paper on this subject to the following effect:—

Looking over the many inventions and changes introduced of late years and tending to the benefit and wellbeing of the farmers, he placed the use of commercial fertilisers above all others. They were introduced into this district at a critical time, when it was exceedingly difficult for the farmer to make ends meet They often had to be content with a few bushels of wheat per acre, or with hay they measured the cut in hundredweights. His first experience with these manures was with Thomas phosphate, which he had drilled in at the rate of 100 lb. per acre on a piece of land from which he did not expect much of a crop. The yield was, however, 30 cwt of hay per acre. The following year he purchased a drill and a few tons of different manures to try which did best; these included Thomas phosphate, several brands of mineral super, guano super, complete manure, and others. He found that all of them paid well to use He had tried various quantities of manure, from 70 to 100 lb., and on small plots up to 200 lb. He was confident that on his land 100 lb. per acre paid better than smaller dressings. Even 70 lb. made a great difference in the yield, but he thought the extra quantity of manure caused a more than corresponding increase in the crop. He was convinced that manured crops did not blight so quickly as unmanured. He had always been satisfied with the way hay from a manured crop weighed. While he averaged about 100 lb. of manure per acre, he put on less with the first sown and more with the late sown Best results were obtained by drilling in the seed and manure together. In regard to the after-effect of manures, he was sure his land produced three times as much feed now as formerly.

The question was how long were they going to get these results. Most farmers had noticed that the first year the manure had a more marked effect than the same dressing applied afterwards. It was not wise to apply the same fertiliser to each succeeding crop. He always tried to avoid two successive dressings with mineral super. Some time ago he saw a manured crop on a paddock, a portion of which had been manured for a previous crop; there was as much difference in the growth on the two portions as on manured land and unmanured. A change occasionally to guano, bone super, or bonedust and mineral super mixed was advisable. He had noticed that with Thomas phosphate on sandy land the effect on the second year's crop was nearly equal to the first year. The manures were sometimes blamed for the spread of weeds, whereas what actually occurred was that the weeds, like the wheat plant, grew better on manured land, and were consequently more prominent. This was, however, not the case with stinkwort; as far as his experience went it did not thrive so well on the manured lands.

The use of manures had unquestionably improved the position of the farmers; they got better returns from their labour, and were in a better position to pay their way; the land had increased in value, especially poor soils, which were formerly regarded as useless for wheatgrowing. The State had also benefited considerably from the introduction of manures. First there was the increased circulation of money, a considerable amount being for labour; then there were the railway charges on the carriage of these fertilisers; the increased production of wheat, wool, stock, &c., also meant increased revenue to the State in all directions. In fact, it was very difficult to even estimate the ultimate benefits secured.

Mr. W. Day had tried various manures; super. did best. Thomas phosphate was too slow, but benefit showed in the second crop. Mr. Marshall did not think it necessary to apply 2 cwt. per acre of manure. He had applied bonedust and super to one paddock, and after three years the portion manured with super was still yielding better than the other. Mr. Arnold thought Prof. Lowrie was right in recommending heavier dressings of manure, but Mr. Hancock stated that 85 lb. of super per acre had given him better returns than 2 cwt. The Hon. Secretary found Thomas phosphate of little use on scrub lands, but on sandy, loam, or clay it did better. Guano super had done well with him. Other members also spoke well of guano super.

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of persons registered and found employment by Government Departments and Private Employers from July 27, to August 29, 1902.

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths	95	181	284
Masons and bricklayers	2	—	4
Plasterers	—	—	1
Tilesetters	—	—	1
Carpenters	9	1	—
Painters	4	1	2
Plumbers and ironworkers . ..	2	—	—
Fitters and turners.. .. .	4	—	1
Blacksmiths and strikers	5	2	—
Moulders	4	—	2
Pipejointer	—	—	1
Gardener	—	—	1
Apprentices	14	4	2
Cleaners	10	2	—
Porters and junior porters	3	—	—
Rivet Boys	3	—	1
Totals	155	191	300

August 29, 1902.

A. Richardson, Bureau Clerk.

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Industry.

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DEPARTMENTAL NOTES AND WORK.

The Minister of Agriculture, in his opening address at the annual Congress, intimated that the Government had decided to ask Messrs. F. Krichauff and A. Molineux to accept the position of "life members" of the Council of Agriculture, in recognition of the valuable services rendered by them to the producers of this State. Members of the Agricultural Bureau will be pleased to learn that both gentlemen have accepted the position, and are now members of the Council.

The fourteenth annual Congress of the Agricultural Bureau was held in Adelaide during Show week, there being considerably over 200 members of the Bureau present at one or other of the meetings. Special interest attached to three items on the programme, viz., Professor Towar's address on his impressions of South Australian farming, the farewell presentation to the late General Secretary of the Bureau, and the Conference of officers of the Bureau. The first two were eminently satisfactory. A large gathering of farmers listened with great interest to Professor Towar, who created a very favourable impression. The presentation of the address to Mr. Molineux was made by the late Chairman of the Bureau, Mr. F. E. H. W. Krichauff. The address took the form of an album, containing the signatures of the members of the Central Bureau, and of 104 branches of the Bureau, together with the signatures of the officers connected with the Department. The album, which was prepared by Messrs. Vardon & Pritchard, was exceedingly well got up, and forms a unique testimony of the respect felt by the members of the Bureau for their late Secretary. Of the Officers' Conference, and a few other matters connected with the Congress, we propose to speak later on.

The annual Conference of the Hills Branches of the Agricultural Bureau is to be held at Forest Range on Thursday, October 16, and a Conference of branches has also been arranged to be held at Angaston on November 5 and 6. It is earnestly hoped that the neighbouring branches will heartily support these Conferences, as much good must result from the interchange of ideas that take place. Apart from the Conference both districts are of considerable interest to those engaged in the cultivation of the soil.

The Angaston and Tanunda Branches of the Agricultural Bureau are offering prizes for the best cultivated vineyards in the district. Prizes are offered in two sections — viz., for vineyards of over 20 acres, and for those of from

10 to 20 acres. The total prize money offered is £25, and the judging is to take place early in December. This is a practice that might be followed with advantage in other districts.

The usual farmers' visit to the Roseworthy Agricultural College took place on Monday, September 15. From 300 to 400 farmers availed themselves of the Hon. Minister's invitation. Some were disappointed in not being able to secure tickets. This, in the circumstances, was inevitable. To provide refreshments and conveyances for over 300 persons taxes the College and Department's funds somewhat heavily. It is thought that next year the difficulty might be overcome by making a charge of 2/6 for a ticket. This would defray cost of entertainment and conveyance from the railway line. We feel certain that no genuine producer would object to so small a charge.

It is unfortunate that the College crops should have been somewhat disappointing. For this the season is largely accountable: had Professor Lowrie had charge of the seeding it is difficult to suppose that he would have improved much on matters. Had the College authorities deferred seeding until the arrival of rain, it would have been impossible to sow the 500 acres that had been fallowed. As is it the grain was sown in dry land, with the result that germination was exceedingly defective, and the poppies at a later date smothered out the wheat plants. What an object lesson to those who advocate thin seeding!

Heavy rains had fallen in March, and in April the soil was still sufficiently moist to cause the germination of some of the seed; in others it malted and had to be resown. Germination was more satisfactory in light land than in heavy land; this is the common experience of dry years. The late crops sown in May, when the land was quite dry, are by far the most satisfactory.

There is another factor that may account for the faulty germination. The grain was uniformly pickled with a 1 per cent. solution of blue stone. It is probable that more uniform germination would have obtained had the seed been sown in its natural state. At all events neighbours sowing at the same time unpickled grain can boast of a far more satisfactory germination.

Farmers will have noticed what havoc poppies can play with a crop. It appears to us that the use of a large horsedrill, such as was constructed formerly to accompany the old Garrett seeddrill, may in certain cases become indispensable. In any case the poppy is exceedingly difficult to control; it germinates late in June, and unless the wheat is pretty thick, and forward, it is at the mercy of what Professor Lowrie used to call "his special enemy." The college fallow land was kept clean throughout the past season, and yet the results are eloquent as to the power of the poppy. It is a question that requires careful attention.

The College live stock was in good condition, and much admired by visitors. The crossbred Dorset horn ewes showed the advantages of grazing on well-manured paddocks. The Jersey cattle, too, were recognised as forming a good uniform little herd.

We are pleased to be able to chronicle the College's success at the Royal Agricultural Society's Show. The first and second prizes in the open class for lambs fell to the College; the first pen were crossbred Dorset horns; they realized subsequently 26/ a head; the second pen were crossbred Shropshire lambs; the latter realized 22/ a head. The first pen averaged 57 lb. dressed weight. The College was also successful in securing first prize for freezers; the latter realised 18/ a head.

The Minister recently received a letter from Mr. G. S. Thomson, the Dairy Instructor, who is travelling through Europe, asking for an extension of his leave of absence to January 1. To this the Minister has agreed, as Mr. Thomson is travelling for educational purposes through the main European dairying centres. His reports on dairying questions will be awaited with interest by the producers of this State.

The Inspector of Vineyards reports to the Phylloxera Board, under date September 10, 1902, to the following effect:—"The work of boarding the interstate trains and boats, which was successfully carried out last year, was resumed at the beginning of May on my return from inspecting the southern vineyards. I am pleased to report that there has been a marked decrease in the number of parcels of plants, cuttings, &c., detected coming across the border in a clandestine manner. The Customs Inspector at the Adelaide Railway Station, who is always present on the arrival of the express, agrees with me that the plants, &c., so imported show a reduction of fully 70 per cent. as compared with last year. Neither the customs officers nor myself have detected any vines or vinecuttings in the parcels imported during the past season. I would suggest that next season steps be taken to prevent the introduction of plants over the south-eastern border, as we have it on very good authority that plants and cuttings are frequently brought across from Victoria. A few weeks spent in the locality by the inspector would effectively check what certainly is a most dangerous practice. The local police officers could render considerable assistance in this direction. The south-east, Renmark, and the Torrens Valley will always demand most constant and careful watching, the latter district particularly so. Three years between each inspection is too long a period, and as soon as I have finished the vineyards on Yorke's Peninsula, and a few small districts not previously attended to, I hope to be able to make a further inspection of the Torrens Valley. While up to the present no indication of phylloxera has been detected, it must be remembered that it is highly essential to locate the first centre of attack as early as possible if we are to deal successfully with this pest.

During the month the Inspector under the Vine, Fruit, and Vegetable Protection Act in the Stanley district has visited a number of orchards respecting the scraping of tree stems and other winter operations necessary in the campaign against codlin moth. The other country inspectors have not yet begun operations. The time of one inspector has been fully occupied in the examination of fruits, vegetables, and plants exported under Government certificates to New South Wales and Victoria, and in passing consignments of fruits and plants brought to the State via Port Adelaide.

Besides inspecting on similar lines and carrying out usual office work Mr. Quinn has lectured at Summertown before the literary society on "Garden Manures" and in various fruitgrowing districts inspected the orchards of those persons who have offered to co-operate with the department in the projected simultaneous tests with arsenical spraying for the suppression of codlin moth.

For the month ending September 26 7,490 cases of fruits, of which 5,006 cases were bananas and 2,077 cases apples, were imported into this State. Thirty parcels of plants were also imported, most of which came by parcel post. Two parcels, containing grape vine cuttings, were confiscated and burnt, and the consignees warned that in future such evasions of the law would be followed by rigorous prosecution. During the same period 2,490 cases of fruits of various kinds were exported, under inspectors' certificates. Of these only 1,321 were grown locally. Twenty-two parcels of plants and 1,696 packages of vegetables were sent away under certificates of freedom from diseases prohibited by Victorian and New South Wales Vegetation Diseases Acts. With few exceptions these consignments were dispatched to Broken Hill.

COUNCIL OF AGRICULTURE.

The second meeting of the new Council for Agriculture was held on September 25 at the Roseworthy Agricultural College. Members visited the institution with a view of familiarising themselves with its work and requirements. They were shown over the farm, land, and premises, and subsequently held their meeting at the college building. The following were present:—Mr. John Murray (in the chair), Col. Rowell, and Messrs. Basedow, Bruce, Dawkins, Laffer, Miller, Marshall, Sandford, and Yelland, and Professor Perkins. A letter was received from the Minister of Agriculture (the Hon. R. Butler) defining the duties of the council and the scope of the work to be covered by them.

Mr. A. D. Bruce moved that all members be granted free passes on the railways. He considered that in the interests of the State members should be able to travel throughout the agricultural districts.

Mr. Miller seconded the motion, although he thought that it was unlikely the Government would agree to the request. Mr. Marshall thought that members should have the opportunity of visiting the country, and be allowed free tickets for the purpose. He did not, however, think it was right that free passes should be issued, as they might be used for private purposes. He moved an amendment that free tickets be allowed when travelling on board business, but this was lost.

Several other members spoke on the subject, generally agreeing in principle with Mr. Bruce, but pointing out difficulties that might arise. Mr. Bruce said it would entail no loss of revenue to the State, but would be merely a question of bookkeeping between the department and the railways. Professor Perkins pointed out that if passes were to be granted a new line would have to be put on the Estimates, as it would cost the department £325, for which no provision had been made. He added that he had no doubt the Minister would authorise the issue of free tickets when members travelled on board business. After some further discussion the motion was carried, some members abstaining from voting.

Subsequently Professor Towar was requested to attend the meeting, and was asked whether he had any matters he would like to bring before the board. Professor Towar said the request was unexpected, and consequently he was not prepared to bring any definite suggestions before them. He criticised the furniture in the institution, and said that he hoped that in time he might be given something more worthy of the college. He then referred to the need of a slaughterhouse and hanging room, stating that he understood that this point had been raised on several occasions previously. He pointed out that the institution was without a library, and that he thought something should be done in the matter. If shelves were provided some books could be got together, as parents of students had promised subscriptions. He thought that the college poultry yards might be extended. He would like a few head of first-class stock of different breeds in the college farm as object lessons. He suggested that short courses in special subjects might be delivered at the college.

Subsequently the council unanimously passed the following resolutions:—

1. That the council urges upon the Minister the absolute necessity of providing the college with a suitable slaughteryard and hanging room before the arrival of the hot weather.

2. That the council urges that the college be connected with the Barossa waterworks at the very earliest opportunity, and that suitable arrangements be made to dispose of sewage to meet objections recently raised by the inspector of the Board of Health.

3. That the council urges upon the Minister the necessity of supplying the college yearly with a special grant to go towards the equipment and maintenance of a library.

Mr. Dawkins thought that the council would be kept in better touch with the institution if Professor Towar forwarded monthly a short progress report on the various operations carried out there. He moved that the Minister be asked to give the Principal instructions to that effect. This was seconded by Mr. Marshall, and carried.

Mr. Marshall drew attention to the unsatisfactory state of the poultry at the college. Mr. Bruce said that he had no doubt that donations of valuable birds to the institution could readily be obtained. Mr. Miller referred with approval to the magnificent poultry yards of the Hawkesbury College. Professor Perkins said that he doubted whether much was to be gained by doing things in such a lavish scale, either from the educational point of view or from that of profit. He reminded members that the institution must pay its way. It was decided to refer the question of the poultry to the college committee.

Professor Perkins stated that the department was still in correspondence with the Victorian Goverument in reference to the exclusion of our poultry from Victoria. Mr. Sandford stated that the question was not likely to affect us much. Victoria was not an importer of poultry, but a large exporter. He thought that the Victorian prohibition had been adopted merely to render possible certain local attempts to stamp out the tick.

It was decided that at future meetings of the council the press should be invited to attend.

ROSEWORTHY AGRICULTURAL COLLEGE NOTES.

EXPERIMENTAL VINEYARD.

BY H. E. LAFFER, SUPERINTENDENT OF VINEYARD.

September is almost past now, and up to the present only 0.69 of an inch of rain has been recorded at the College. This has only been sufficient to keep the surface moist, and has not reached the subsoil.

The crop of grapes will now be dependent on such thunderstorms that may fall during the summer months, for there is no reserve of moisture in the soil. Vines up to the present are coming into leaf, and look fairly vigorous. Many of the earlier varieties are fairly well forward.

Ploughing has been completed, and scarifiers are now being worked to reduce the rough surface to as fine a tilth as possible.

So far it is too early to observe the effects of different manures applied.

Almonds, as usual, though carrying abundance of flowers in good setting weather, have very little fruit on them. It would appear that away from the coastal districts the setting is very uncertain, and the trees are by no means profitable. Their main use, as far the College is concerned, is to form a breakwind and to detract somewhat from the bareness of the landscape.

Young vines planted this year to fill up blanks appear to be wanting in vigour, and there is a possibility of their having to be planted again next year.

In the wine cellars, the usual spring racking of wines has taken place, and various operations necessary have been attended to.

The weather on the whole has been mild, though there have been a few hot sultry days. The lowest minimum thermometer reading was 30 deg. Fahr. and the highest sun temperature 138 deg. Fahr.

Rabbit Poisoning.—Mr. Herbert H. Wettenhall, Carr's Plains, Stawell, writes The Australasian:—It is sad to see the number of birds which are destroyed by prosphorised pollard, especially magpies, and thinking any move to check this is only right, I would tell how I distribute it (the phosphorised pollard). I make a trail, let the pollard run through a pipe into it, and drag a triangular-shaped piece of iron or a heavy chain along after, and attached to the hoe (which is making the trail); this replaces the earth in the place the hoe scratched out, and covers the pollard; I find this kills some birds, but not nearly so many, and one trail like this is equal to two or three with pollard uncovered, because then one rabbit may eat enough to poison many. I find that in time all the pollard will be gone that was placed in the trail, and not a bit of the replaced earth will be left unscratched; in fact, I consider it in every way more effective. If the ground is in good order, scarcely a bit will be exposed, and the sheep need not be removed, &c.

THE VALUE OF IRRIGATION TO THE DAIRY FARMER.

By A. J. Ridgway, Grange.

Those who have seen the wonderful results derived from the irrigation of green crops as carried on by a number of dairy farmers between Adelaide and the sea have no doubt of the immense advantages to be gained by intense culture on small areas with the aid of plenty of water. For the information of those who have not seen this system practised I will give a short account of the cost and means adopted for irrigating from 12 to 20 acres of land.

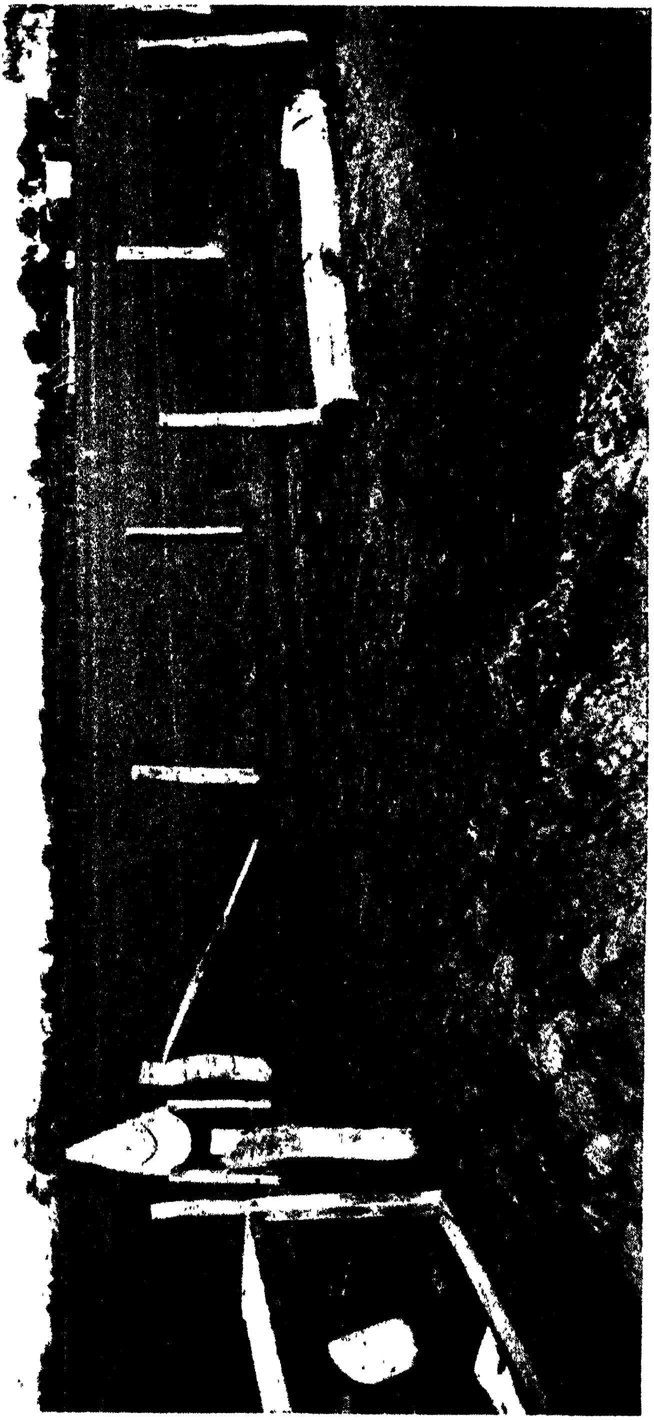
Of course the first essential is a good supply of suitable water within a reasonable distance of the surface. Then the land should be as level as possible, or with a gentle fall in one direction in order to avoid expense of grading and levelling. Sink the well at one end or in the centre of the field. In the locality in question if water can be obtained within 50 ft. the well is made 10 ft. square. The cost will vary with the nature of the soil, conveniences for sinking, and depth required. For raising water an oil engine is used: an 8-h.p. engine, with 3-in. pump will draw water at the rate of 14,000 gallons per hour, and this will thoroughly water an acre of land per day of eight hours at a cost for oil of about 2/. The engine and pump will cost about £170.

In distributing the water it is carried down the centre of the field in galvanized-iron fluming fixed to timber supports, as shown in illustration. About every 30 yards there are openings for distributing the water, 6 in. or 8 in. galvanized pipes with calico or canvas connections for regulating the spread of water being used. The fluming and pipes will cost about £2 10/ per chain complete. One man can look after the engine and attend to the water.

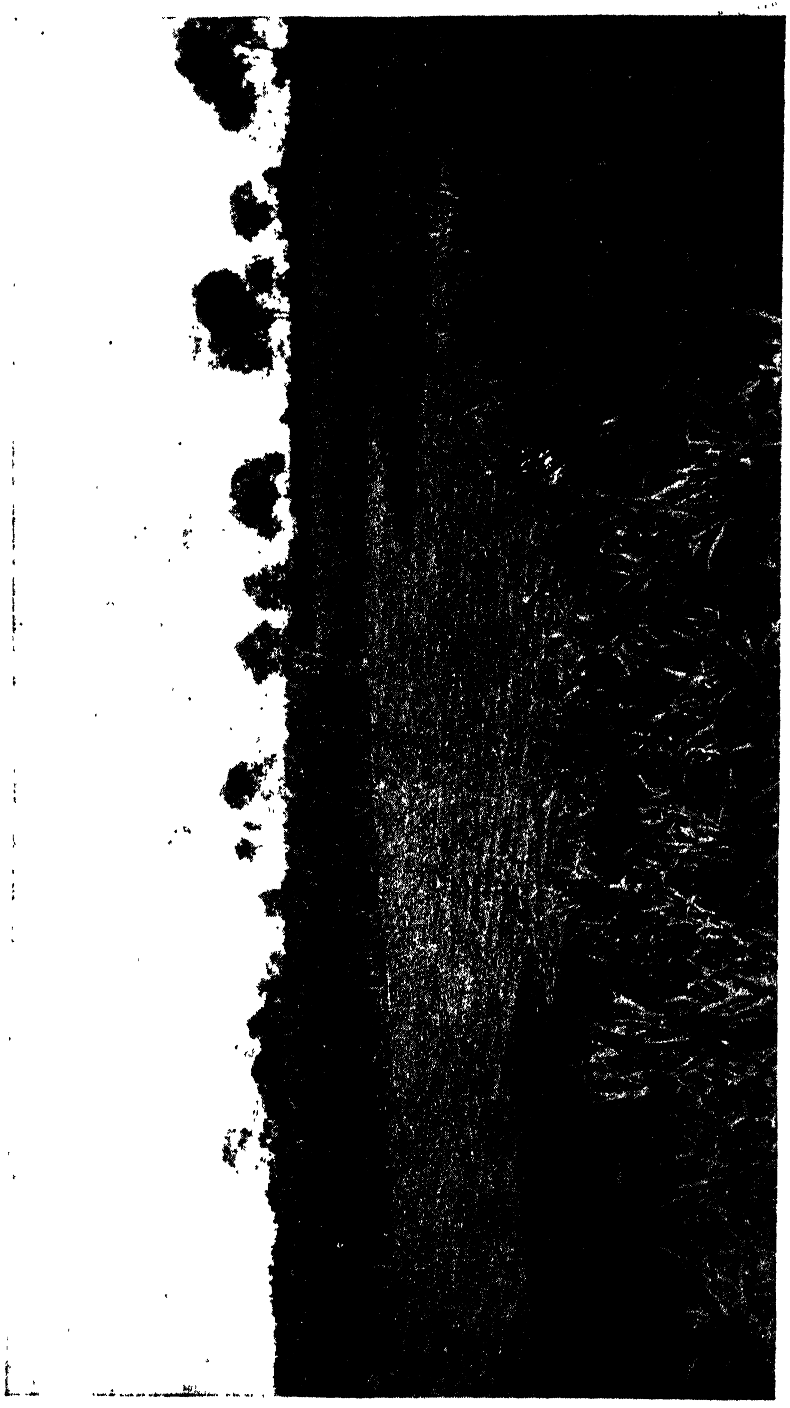
When the water is available for irrigation purposes lucerne is one of the most profitable crops that can be grown. The land must be well ploughed and manured, and worked down to as fine a tilth as possible, as a good seed bed is absolutely necessary. The seed is drilled in both ways of the field at the rate of 8 lb. each way, the land being afterwards rolled. Nearly all the growers prefer to make a heavy seeding, and so secure a full take, as if too thick the ground can be harrowed, while a poor take means practically a season lost. Seed is sown about the end of September or beginning of October, and three or four cuts taken the first season. Afterwards it is cut about every five or six weeks during the summer and autumn. Lucerne is watered about every two weeks, or twice to each cutting.

Sorghum is coming more into favour every year on account of the heavy crops that can be grown and its splendid feeding qualities. It grows to a height of 10 ft. to 12 ft., and gives a first cut up to 50 tons of green feed to the acre, a second cut up to 25 tons, and sometimes a third cut of 3 to 4 tons. It should be drilled in about the end of September or early in October; every other hole in the drill being closed to leave the rows wide enough apart. The land must be well manured. The best varieties of sorghum grown here are Planters' Friend and Extra Early Amber Cane (black seeded). The former gives the heaviest crops, while the latter is fit to cut several weeks sooner. Sorghum is cut when well in flower, and chaffed before feeding; it is watered about every 10 days. The illustration shows sorghum uncut, and in various stages of growth after the first cutting.

A small plot of maize should be sown about the same time as the sorghum, as it will be ready for cutting some weeks earlier. In February, barley, rye, and wheat can be sown for early winter feed; if watered and manured will be ready to cut within 10 weeks. It is only by following out some such system of irrigation that the dairy farmers can possibly secure an abundance of green fodder for a dairy of 50 cows right through the summer and early winter, and so keep up the quantity and quality of his milk supply.



Showing System adopted for Conveying and Distributing Water on the Field.



Irrigation Results—Crop of Sorghum showing Growth before and after Cutting.

FARM HINTS FOR OCTOBER.

By A Molineux

There are advantages to be gained from early shearing, but these are somewhat discounted by drawbacks. With early shearing the work is got through before hay harvest, seeds of spear grass are avoided, and there is leisure to prepare for urgent work in the near future. By later shearing danger from night frosts is avoided, and there is a better chance to secure shearers who have finished with the back country sheds. At whatever time the shearing is done it is important to have the floor on which the work is done thoroughly cleansed from chips, string, and everything of a vegetable nature which can become mixed with the wool. The value of the wool is very considerably affected by the treatment it receives at shearing time, and it will well repay the owner of the sheep to make himself thoroughly well acquainted with all that pertains to the requirements of the buyers and manufacturers. The lectures, demonstrations, and classes conducted by Mr. George Jeffrey in all parts of the State should lead to a great improvement in the get-up of South Australian wool in the near future.

Hay harvest will soon occupy attention even in the latest districts. The first thing to consider is the best time to cut the hay. If colour alone were required the farmer would get it down at flowering time; but the nutritive value of hay seems to be greatest when the grain has begun to harden, and the colour to become rather on the golden side. The position of the stack-yard is important. The stacks should be built where the floodwaters will not collect, and where the teams can easily get in and out. It is not desirable to build close to a road or any place where fire is liable to get. Place sufficient dunnage on the floor to prevent damage from damp from below, and fence the stacks around when built to exclude stock and tramps. Hay should not be left on the field one hour longer than is necessary to cure it, and when in stack should be protected at once from rain. Precautions should be taken to prevent grass fires extending to the stacks.

Most of the South Australian farmers have not sufficiently advanced their practice to realise the advantages that may accrue from growing leguminous crops and ploughing them in to enrich and improve the "mechanical condition" of their soils; but the time will inevitably come when this practice will prevail. At first they will probably grow such crops to be fed down (and that will prove beneficial), but later on peas, vetches, clovers, and many other plants will be used, especially for green manuring. These crops will be ploughed under when in flower, and the land will probably be ready to grow a summer fodder crop soon after.

It is not a safe thing to sow maize, sorghum, holcus, millet, or any similar crop broadcast, because it will be impossible to cultivate with the hoe or other implement. If the land has been well prepared, there will be almost a certainty of a fair crop that has been drilled and cultivated several times; but there is only a distant chance of good results from a broadcasted crop. It is a good plan to soak the seed 48 hours before sowing; sow on finely pulverised soil at a depth of 1 to 2 in., roll on the drilled lines to compress the soil a little, and when the plants show plainly set the hoe to loosen the caked surface about 2 in. deep. Maize should be drilled at 30 in. apart in the rows and 18 in. between the plants. Sorghum and similar plants can be put a little closer in the rows, but room must be left between the rows for the horse-hoe.

I am strongly of opinion that the growing of a "cultivated" crop of summer fodder plants on fallowed land does not reduce the capability of that land to produce at least as heavy a crop of cereals as will be produced on adjacent land that has not been cropped—that is, land that has been bare fallowed. In fact, I believe that the land that has grown a summer fodder crop will be in better condition for the production of a cereal crop. I am by no means convinced that bare fallow stores up rainfall of one season to supplement the deficient rainfall of the next to render the production of a cereal crop possible. But there is no doubt that fallowing after cultivation of the soil does promote absorption of moisture from the warm, moist atmosphere of summer and autumn; it retards evaporation by breaking the capillarity of the soil, and promotes the solution of the organic and chemical constituents of the soil. I think that the shade afforded by the presence of a green crop on the field tends to conserve the moisture of the soil, and aids the nitrifying agencies, as well as contributing a considerable quantity of organic matter to the soil in the shape of roots, stumps, and waste of the crop that has been raised.

Peas can still be sown in the southern and cooler and hilly districts. One and a half bushels of seed is sufficient to drill an acre in rows 2 ft. apart, 1 in. deep, rolled at once, and hoed at intervals until the growth of the plants makes that impossible.

When Australasia comprises 20,000,000 of inhabitants it may be profitable to manufacture beet sugar in some localities where fuel and water exist in unlimited quantities; but it will pay now and all the time to grow sugar beets and mangolds for cows and other live stock in any place where the soil and climatic conditions will permit. Those conditions prevail and such localities exist far more generally than many people imagine, and it is desirable that every owner of live stock should try the experiment of growing those plants. A single experiment is not sufficient to decide the question either way. Comparatively dry climate and poor soil may produce fairly satisfactory crops if proper attention is given to the preparation of the soil and after-cultivation of the plants. Large roots are not as rich as those of smaller size, and it is possible to get a good crop of small roots off a field by planting closer where the conditions are not favourable to the growth of large ones. Where the soil is shallow the globe and tankard varieties of mangolds should be grown, and the beets should be of those varieties which are most approved by sugar manufacturers.

Many farmers could grow potatoes, and setts can still be planted, in rows 30 in. apart, 4 in. deep, and 12 in. between the plants. Whole potatoes about the size of a hen's egg, with two or three eyes, are best. Larger seed should be cut to about the same size. If more than three stems are produced to each plant the tubers will be small. Plant with the eyes lowermost, and press down upon the loose soil. Do not earth up, but cultivate as often as possible, and try to put on a good mulch of old litter when the crop is half-grown. Irrigation once or twice will make a certainty of a good crop.

Sunflower seeds should be sown in rows 3 ft. x 2 ft., and the plants cultivated with the hoe until they render that work impossible. Potash is required for this crop. If sown rather thickly broadcast, the leaves and stems make agreeable food for cattle and horses. The seeds are very rich in oil, and a pint per day will be quite enough to feed a horse or a cow. This will give the animals a sleek, healthy appearance. The seeds are beneficial for fowls, but must be fed in moderation, or else liver troubles will ensue.

On sandy and stony soils it may pay well to grow some buckwheat for bee forage, feed for cows and other stock, and for the seeds, which are splendid feed for all kinds of feathered animals as well as for human beings in the shape of buckwheat cakes. A bushel of seed is enough to drill an acre, but more is required if sown broadcast. The plant begins to produce seed eight weeks after sowing, and continues producing for a long time, therefore it is necessary to cut the crop when there is a maximum of seed on it. It is best to feed the straw rather dry to cattle, because they are liable to eat the green stuff too greedily, and become "blown."

Our farmers do not grow pumpkins and cow melons as a rule, and they lose through their neglect to do so. The land could be prepared before September by digging in a lot of well-decayed farmyard manure where the "hills" are to be sown. These should be 12 to 15 ft. apart. Twelve seeds should be put in each hill, and the plants reduced to six if all should come up, and to three when the fourth leaf appears. It is desirable to sow some maize widely apart among or between the hills to prevent the runners being blown over by the wind, as any shifting will rupture the stems.

So much has been printed in this and other journals about the advantages of the silo that it becomes almost sickening to refer again to a subject in which our farmers will not take any interest. But the advantages of the system are so manifest in all other countries where the practice is general that we must continue to advocate it. Now is the time to fill some of the pits or to build stacks of green stuff, and at the same time to grow crops for ensilage during autumn. This will involve some hard work, but very little good of any kind can be secured without work.

If manure from the stable and yards has to be loaded up to get it out of the way, it will be far better to carry it at once and scatter it on the fields than to make a dungheap. Little or no loss of nitrogen can occur until the stuff has fermented and produced ammonia, and it cannot ferment readily when scattered on the field. If it can be ploughed in it will be all the better, as it will then decay, and the soil will fix the fertilising materials.

During this and next month many of the native grasses will produce seeds, and as many of the best of these are annuals, it is desirable that they should be allowed to mature their seeds for replenishment of the pastures next season. It might pay to leave several acres for seed, and harvest the same for resowing the other paddocks.

THE IMPROVEMENT OF INDIGENOUS FODDER PLANTS IN ALGERIA.

By E. Scribaux, Professor at Paris Institut Agronomique.

[I have adapted the following article freely from the French, with the idea that it might be of interest to those of us who would benefit by the improvement of our natural flora. We have many native leguminous plants; is it not possible that some of them might be brought under the influence of cultivation and turned to better account than is at present the case? At all events plants that succeed in Algeria will succeed here, and I shall endeavour to secure some at an early date. Ten years ago I bought some sulla seed for Professor Lowrie; but unfortunately practically none germinated; but we did not treat it with boiling water. From experience I can vouch for its luxuriant growth in North Africa, and for the eagerness with which it is eaten by stock of all kinds, either green or in the form of hay.—A.J.P.]

For years past Algerian agriculturists have been making desultory attempts to improve their pasture lands, apparently, however, without success. I am inclined to think, however, that after several years of experiments Messrs. Knill & Ryf have finally solved this question.

When he is able to irrigate, the Algerian agriculturist invariably falls back upon lucerne, which, undoubtedly, in such circumstances, yields the most profitable returns. For situations, however, in which rainfall is deficient and summer heat intense, no suitable plants have yet been forthcoming; it is here that Messrs. Knill & Ryf's experiments are of interest. After numerous trials they abandoned attempts at acclimatisation of foreign plants, and set about cultivating indigenous plants that were known to be tasteful to stock. They addressed themselves particularly to leguminous plants.

At the outset these gentlemen experienced considerable difficulty over the germination of these seeds. In 1890 they forwarded me some seeds of sulla (Maltese clover; French honeysuckle), which their experience had shown to be particularly refractory to germination. I placed these seeds in the best conditions possible of heat and moisture, but in 18 days' time not one seed had germinated. The sulla seed is more or less hairy; I first scraped the down off, with the result that I obtained a 13 per cent. germination. I then slightly perforated the husk of each seed with a sharp knife; in this case every seed germinated in three or four days' time.

We had, therefore, to deal with seed, that I shall in future distinguish as "hard," i.e., possessed of an impervious husk, that prevented the germ from coming in contact with moisture. After various tests, I devised a simple means of overcoming this germination difficulty. I succeeded in obtaining perfect germination by immersing the seed in boiling water for the space of about five minutes—the exact amount of time necessary can be determined beforehand on a small sample. The simplicity of this method is evident, and puts it within the reach of everybody. It is, necessary, however, to keep the seeds well stirred up whilst in the boiling water; unless this is done, owing to their extreme hairiness they remain more or less completely surrounded by air bubbles, which prevent the water from coming in direct contact with them. By these means I obtained a 95 per cent. germination, the germs continuing perfectly sound and in nowise affected by the extreme heat.

By slightly crushing the seeds in a specially constructed mill I obtained equally satisfactory results. I append in tabular form the results of my experiments:—

GERMINATION OF SULLA SEEDS DURING 18 DAYS' EXPERIMENTS

	Seeds Germinated	Intact and sound.	More or less decayed
	Per cent.	Per cent	Per cent.
1. Seeds in natural condition	0	100	0
2. Seed with hair removed	13	85	2
3. Seed with husk slightly cut	100	0	0
4. Seed steeped in boiling water for 5 minutes ...	95	5	0
5. Seed steeped in boiling water for 10 minutes ...	73	8	19
6. Seed steeped in boiling water for 15 minutes .	41	5	54
7. Seed steeped in boiling water for 20 minutes ..	41	7	52
8. Seed steeped in boiling water for 1½ hours ...	0	2	98

In 1891 Mr. Knill forwarded me seeds of native vetches and lucernes many of which were equally resistant to germination; in their case treatment with boiling water was not successful; better results are obtained by slightly crushing the seeds. In working on a small sample good results are obtained by mixing the grain with sharp sand and beating the mixture with a flexible rod: the grains of sand show a tendency to tear open the seed envelope sufficiently to allow of subsequent admission of water to the germ.

These laboratory results were reported to Mr. Knill, who has since applied them very successfully in practice.

Mr. Ryf's experiments had mainly reference to native lucernes; these wild lucernes are extremely numerous in Algeria, not all alike, however, being equally suitable for purposes of cultivation. Mr. Ryf refers to a lucerne he has in view in the following terms:—

"Its extreme hardiness and adaptation to soil and climate of Algeria distinguish this native lucerne from the ordinary European cultivated variety. Once well rooted, even in the poorest of soils, where cultivated lucerne would inevitably fail, the wild indigenous lucerne lives, develops, and lasts almost indefinitely. In the neighbourhood of Setif, in spite of frequent working of the land for cereals, many fields may be found that resemble sown crops of ordinary lucerne. In fact cultivation of the soil appears to improve its growth in every way. It makes rather hard hay, but readily taken by stock. In winter one frequently sees stock working up the roots and suckers with their feet, and subsequently eating them. It may be added that the roots of this plant penetrate 6 to 7 ft. below the surface of the soil, which fact may serve to explain the ease with which they are able to resist drought."

Mr. Ryf has found it necessary to work the ground very thoroughly before sowing, otherwise germination is apt to be irregular; sowing must take place as soon as all fear of late frosts has passed. [In September in South Australia.—A. J. P.] The plants do not require the help of artificial irrigation. After various experiments Mr. Ryf places his drills about 40 in. apart, and grows a crop of wheat between them every other year. He finds that breaking up the roots with the plough, prior to seeding for cereals, enables the lucerne to make stronger and better growth. He estimates that these roots by decaying help to enrich the soil, as they have been shown to contain from three to four times more nitrogen than farmyard manure. Further, they open it out and permit of a more perfect penetration of moisture. He believes that the whole field can with advantage be ploughed up every other year without in any way injuring the lucerne. He believes that this lucerne can be most profitably grown when sown alternately with cereals as previously stated; in this manner the same plot of land can be made to yield good cereal crops, hay, and plenty of grazing space.

In addition to this native lucerne, Mr. Ryf describes several plants almost equally interesting.

RAPE FOR PIGS.

A series of experiments to test the value of rape for pigs carried out at the Wisconsin Agricultural Experimental Station, are thus summarised:—That with pigs from four to ten months old, representing the various breeds of swine, an acre of rape, when properly grown, has a feeding value, when combined with a ration of maize and bran, equivalent to 2,436 lb. of a mixture of these grain feeds. That rape is a better green feed for growing pigs than good clover pasture, the pigs fed upon rape having made on the average 100 lb. of gain on 33.5 lb. less grain than was required by the pigs fed on clover pasture. That pigs are more thrifty, have better appetites and make correspondingly greater gains, when supplied with a rape pasture in conjunction with their grain feed than when fed on grain alone. That a plot of Dwarf Essex forage rape, when planted in drills, 30 inches apart, early in autumn, will yield three good crops of pasture forage in a favourable season. That rape is the most satisfactory and cheapest green food for swine that we have fed. That every feeder of pigs should plant each spring a small field of rape adjoining his pig yard, and provide himself with a few rods of movable fence, to properly feed the rape to brood sows and young pigs. That rape should be sown for this purpose in drills 30 inches apart to facilitate the stirring of the ground and cultivation after each successive growth has been eaten off. That pigs should not be turned upon a rape pasture until the plants are at least 12 inches to 14 inches high, and that they should be prevented from rooting while in the rape feed. That rape is not a satisfactory feed when fed alone when it is desired to have any live weight gain made in pigs, though it has been found that they will just about maintain themselves without loss of weight on this feed alone.

APPLYING FARMYARD MANURE ON THE SURFACE.

Professor W. F. Massy, of the United States Agricultural Department, writing on the subject of the use of farmyard manure, says:—"Many of our friends still seem imbued with the old liking for well-rotted manure. We do not want to let our manure get well rotted before we apply it to the land. The place to rot the manure is in the soil, where you have the soil to absorb everything. If the manure is spread on the surface the soluble parts immediately wash into the soil, and the loss is smaller than in any way the manure can be treated, far less than piling in the barnyard, either under cover or not. The evaporation from manure spread on the surface is mainly only water, while the evaporation from piled manure is largely ammonia in a volatile form. No matter how well manure is handled there will be always more or less loss from it in the barnyard than in the field. Manure on the surface keeps the soil moist, and prevents the baking of clay soil. In our experience, right on top, as near as may be, is the best possible place for the manure. Lately, I have had a sample on a small scale of the value of surface manuring on a clay soil. We built at our college a new lecture-hall, laboratory, and greenhouses for my department. To get a level site for the building we had to excavate into a red-clay hillside, and pile the clay taken from the excavation on to the lower levels. On the grounds around the building I have been trying to convert the clay into a garden. Grass plots were formed and large shrubbery beds prepared, and planted in the untamed clay. After everything was planted a good coat of manure was placed on the surface, and left there. Last summer was the hottest and driest ever known here, but it was pleasant to see how things grew and flourished in that clay, which was merely the subsoil piled three or four feet deep. This spring the soil in these beds works as mellow as the traditional ash heap, and the bloom of the roses and shrubbery of all kinds is simply amazing, being fully twice as great as with the same kinds of plants set in natural soil. I use all manure as a mulch, either in garden or field. In the garden, after setting plants or planting seed, the manure is spread over the surface and left there to be slightly worked in during cultivation."

A POULTRY MANUAL.

By D. F Laurie

[Four or five years ago the department issued a bulletin on "Poultry Breeding," prepared by Mr. D. F. Laurie. All these have been distributed, and in response to frequently expressed desires for a revised and enlarged edition, dealing also with diseases of poultry, Mr Laurie has consented to prepare the same. The articles will be published first in the journal from month to month, and afterwards reprinted in pamphlet form.—Editor.]

(Continued from September issue.)

Selection of Stock.

Whatever breeds are decided upon by the poultry keeper, the stock must be carefully selected. Reject any that do not conform to the standard, not necessarily so closely as to classify them as exhibition birds, but so much that they are free from any of the radical defects that are mentioned in the standard. Reject any bird which has a crooked breast, or malformed back, crossed or broken beak, or is blind of one eye. Any bird which on examination, is found to be infested with vermin as follows:—Long pointed, quick moving, straw-coloured lice, about 1-16th of an inch long such birds are almost invariably delicate and deficient in stamina, and, moreover, despite of dust baths and attention, seldom lay well.

Avoid long-legged specimens. They are not to be found among typical specimens of the utility breeds. Avoid any under-sized or considerably over-sized specimens, as they are not suitable. The smaller hens may be useful, if of extra fine quality, for toning down coarseness, but the very large ones are not desirable stud birds.

Laying hens should have fine heads, bright eyes, and an alert, active look. The heavy eyed, coarse headed, sluggish females are poor layers. This rule applies to all breeds. In the Mediterranean breeds, such as Minorcas, Leghorns, Andalusians, Anconas, &c., a large, fine comb, set on a fine head, is a general sign of good laying powers. The coarse combed hens are for another purpose, which need not be described here.

Laying hens generally are deeper behind, and not quite so prominent in the breast as the typical show specimens, but not always, and some experience is needed in applying the "type" rule.

The cock to mate with the hens of the laying section should be of the best quality procurable, for much depends on the sire, as his qualities will affect the whole of the progeny of his pen. He should also be of a good laying strain, and, mated with suitable hens, should breed layers. Most breeders of standing are reliable on the subject of the egg production of their stock.

The breeder who has a fine stud of stock birds, and has raised his young birds on a moderate amount of soft food, is to be preferred to one who, for the sake of size and quick maturity, has unduly forced his stock. They may be larger and finer, but years of experience proves them inferior in constitution and as breeders of hardy profitable stock, though a class of birds well suited for the fancier alone. This applies to poultry required for any purpose.

The table bird breeds must be pure, and unless typical specimens of their breed, it is of little use expecting the same results from inferior specimens as are to be expected from typical specimens of those breeds which have a name for table bird production. Long legs are a bad point in table birds, so also are short, shallow breast bones or keels. The breast must be long and prominent, and the body square or cobby. The most profitable table birds are bred from Dorkings, Orpingtons, and Wyandotte hens, crossed with Indian or old English game cockerels. While the fine headed hens will give a good egg yield, the meat carrying, square, or cobby "type" is of great importance. Extra large size is of no value. The great aim in table-bird production is a medium sized stock bird from which quick growing, hardy, plump birds may be expected. There is more profit in marketing chicks at 14 to 16 weeks' old, and weighing 4 to 5 lb., than larger and heavier birds, which do not plump up till several weeks, or even months, after that time.

The large, slow growing, table bird is commercially a mistake, and cannot be bred profitably.

The final test is for general health, and the examination should be as follows:—After handling for bodily defects as stated, turn over the feathers on flank and under wings for signs of tick. A general examination, especially round the vent, will reveal the presence of lice, mites, &c., if such are present. A glance at the vent will disclose any outward signs of diarrhoea, &c. Press the nostrils, and if a glairy, thin, or yellowish thick discharge is present, reject at once. Open the bird's mouth; it should be pinkish and clean, and free from stringy, sticky mucous. If leaden spots on the roof and at back of throat are seen, or cheesy deposits in various positions (especially round windpipe), or foul - smelling ulcers under tongue, reject it at once. The mouth, throat, and tongue constitute an important index to health. Finally, smell the bird, and if there is a stale, dried-fishy smell, be sure there is a good opening for roup, liver disease, and general unhealthiness.

Birds which pass these tests are numerous, but there are plenty, and in the show pen, too, which could not pass, and they are to be avoided. Neglect of these precautions may, and probably will, end in disaster. I consider the observance of these tests of more importance than anything else. When introducing new stock, in addition to the above examinations, each and every bird should be quarantined for a week, or more if necessary, until there is every appearance of health. This is most important, and its observance will guard against the introduction of diseases or insect pests. The careful breeder will overhaul his stock and examine in this manner at least once a fortnight, or oftener if necessary. He will then be in possession of accurate knowledge of the condition of each bird, and any precautions or additional measures necessary may be adopted early.

As a rule, pullets and first season hens should be selected for a start. Hens in their second or third season, if especially valuable, may be bred from to retain the strain. The lighter birds are fit for the breeding pen when matured, say at nine months. The heavier breeds, such as Dorkings and Indian Game, should be nearer to twelve months. This refers, of course, to the average well-grown specimen.

Mating.

As a general rule, the mating of cockerels with first season hens, and pullets with first season (18 months say) cocks, answers well. Influencing the sex of the progeny depends on a variety of circumstances. To gain a preponderance of pullets, mate a cock 18 months to two years old with from seven to 20 pullets, according to his vigour and the size of his run. If he is an active bird, the chances are that early in the season the sexes will balance, but in the later batches the pullets will preponderate. For cockerel production, mate seven or eight hens with a vigorous cockerel, and pullets will be scarce until the end of the season. No hard and fast rules can be laid down on this matter. Many experienced breeders have found that, under certain conditions, a vigorous male running with a number of hens far in excess of the number generally recommended, will guarantee a high percentage of fertile eggs. The opinion has been expressed, and I incline thereto, that mating with too few hens does not give the best results, either as to fertility or vigour of germ, and consequent constitution of chick. Space does not admit of enlarging on this rather important subject. Some breeders mate a male and one female only for each pen and claim good results.

Feeding Adult Birds.

The majority of books published on feeding poultry view the subject from the fancier's standpoint alone, and no allowance is made for the utility breeder. In the following remarks I propose to briefly refer to feeding for various purposes from the utility point chiefly.

QUALITY OF FOOD.

It is poor policy to feed poultry on inferior grain. From sound plump grain and fresh sweet bran, pollard, meal, &c., you can expect definite results. Screenings, often half drake and rubbish, may be good enough for filling the insides of hungry pigs, but are useless for poultry. A few pence saved by buying mouldy, smutty, rubbishy grain may cost pounds in disease, and will certainly entail loss through poor egg yields and slow meat production. Feed well, and at stated times. Do not overfeed, and do not waste. It is waste to overfeed, and it is waste to throw grain on dirty ground where it is soon trampled out of sight. A handful wasted each day makes a large heap at the end of a year, and represents cash lost.

The following should be provided, and no trouble should be considered in obtaining them:—

Water.—Eight inch (or larger) flower pots with a cork in drainage hole for the drinking water, which must be frequently renewed, and kept cool and shaded.

Grit.—Hard, sharp-edged grit, such as broken crockery, quartz, flint, pebbles, &c. This aids digestion, and promotes health and laying.

Shell Forming Material.—Old mortar, sea and oyster shells, old bones crushed fairly small.

Charcoal, or wood cinders, are excellent, and are much liked by laying hens. They aid digestion, and ward off diseases of digestive organs and stomach generally.

Green food should be given daily, as previously recommended.

FOOD FOR HENS FOR EGG PRODUCTION ONLY

Here the production of numerous eggs is the main point, and the forcing effects of any food, while it may affect the hens, goes no further as would be the case with stock birds. The first feed should be given in the morning as soon as it is light enough for the birds to see, and in cool weather, at anyrate, should consist of soft food given warm. This may be bran and pollard so proportioned as to give a mass which will crumble readily when properly mixed with boiling water. Or bran and pollard with a third of ground oats, or barley meal, or bran and wheat meal. These may be mixed with hot skim milk or water. A little green food may be added, and, if obtainable, scraps of meat or rabbit boiled and added with the soup. In Canada excellent results accrue from the addition of 1 lb. of dried blood to each 16 lb. of meal (dry); the blood is, I believe, procurable in Adelaide, and may be used for this purpose, although I should view its use for stock birds with suspicion. The houses for egg producers must be warm but ventilated, and in cold parts the water vessels should be emptied at night, and filled with warm water in the morning. For midday, a good supply of green food may be given, and three times a week a supply of cut green bone, say an ounce for each hen, provided, and on other days a little finely cut raw meat—not too much, say a handful to three or four birds. Lazy, inactive hens will not lay—keep them occupied. If a shed can be provided, and floored with wheat chaff, on which a handful or two of grain can be scattered, it will keep them busy on wet days. In fine weather hoe up a piece of ground for them to scratch in; on a large scale a "Firefly" plough, pulled by a stout lad will give grand results in a few minutes. Wheat cooked in an oven till it is well browned, is an excellent food, and may be given for the evening meal on alternate nights. Handle your birds at frequent intervals to ascertain if too fat or too thin. Provide an ample number of nests for the hens. No male birds are required with the laying hens. Where ducks are kept for egg production the same feeding, &c., will answer well. Give the grain in a shallow vessel of water, they can gather it more readily.

FOOD FOR STOCK BIRDS.

Here a moderate supply of eggs is required so as to produce healthy vigorous chickens. The stock birds may be of the highest quality, but undue forcing and high feeding would tend to losses, which are of small account with ordinary hens kept for egg production alone, but which would mean considerable sums if high priced birds. Here we intend to breed and rear for our own use, or for sale, for others to breed from, or to supply layers with sound constitutions.

The better plan is to keep the hens without a male until a fortnight before the time when it is proposed to breed from the stud. By this method the eggs can be sold at market or elsewhere, and, of course, are infertile. The males will also be gaining in vigour and strength while sequestered, which is important, even if for a few weeks only. My method is to keep the stock hens in nice condition, contenting myself with moderate egg production till I wish to breed from them, and during that time the feed consists of grain, with occasionally a little soft food. All soft food should be mixed with boiling water, but may be given not quite cold, but not hot. When breeding time comes a little green cut bone, and a trifle more soft food, to which some crushed carob bean and bonemeal are added, soon gives as many eggs as are required. Baked wheat may be given regularly. As soon as possible the soft food is discontinued, and only given with other grain as a change. Pepper, egg foods, and all patent concentrated foods have no place in this category, and are better on the manure heap. Sound healthy food, chiefly grain, with bone and shell forming material, &c., will ensure sound, healthy chickens.

Ducks require a lot of soft food, which may have boiled potatoes (if cheap), fat, meat, vegetables, &c., added. As will be seen later on much importance is attached to feeding young stock for the purpose it is intended for.

Geese and turkeys require considerable range, and the stock birds only require additional food, say a month prior to breeding time. At other times the breeding stock can be kept in fair condition.

With attention to housing and the provision of the sundries, and keeping to the food bill as directed, eggs can be obtained at any season from stock birds, without any undue forcing or the use of health-destroying spices or nostrums.

From such soundly fed stock we may expect the most profitable utility birds, and the very best exhibition birds as well.

Birds bred from exhibition birds are handicapped, as the parents are highly fed for show, and then have to be got into normal condition afterwards. Show stock is not the most desirable breeding stock—at any rate during the show period of its existence.

Hatching.

Natural hatching—i.e., by aid of hens, turkeys, or ducks—is giving way largely before the modern incubator, which will be dealt with later on. For the small breeder, who wishes to breed and rear a few each year for various purposes, half a dozen trusty hens will suffice. It is possible to hatch with a number in June, a fresh lot in October, and another lot in April; but it must be remembered that this heavy stocking requires careful attention to the soil of the yards and runs. In the cold parts the stock do not thrive when bred in the cold months, and in the hot dry parts it is equally unsatisfactory to breed during the hottest months, so some regard must be paid to locality and general climatic features. All nests should be on the ground, as described previously under "Hatching Houses." Do not attempt to put too many eggs under the hen, especially during the cold, wet months. If she is unable to cover all the eggs completely the result will be a poor hatch, or perhaps total loss, because she is constantly changing the positions of the eggs, and each in turn, as it reaches the exposed side of the nest, will get chilled, and the germ, in consequence, perishes. Then, again, if a large hatch results the hen treads on several, or she is too small to cover them properly, and they do not grow well.

Set fresh eggs, when obtainable, and wash them, if dirty, before placing under the hen. Mark each with ink or garden pencil, and note in a book full particulars of hen, date of setting, and due date. Hen eggs, 21 days; ducks, 28; geese and turkeys, 28 to 30, average periods of incubation. In making the nest hollow out a shallow depression, sprinkle with a handful of ashes, and line with a little soft straw or dry grass. If necessary, during incubation, the nest may be remade, and the lining, &c., burnt, if vermin are present. Examine the hen carefully for vermin, and, if necessary, use insect powder; not on any account kerosine or any strong smelling insecticide. If you have a sitting of stale eggs give them to a hen which is going broody, and let her have them for a week in her own nest, moving to a more convenient place at night if desired. This will ensure a better percentage than if given to a hen with the broody fever fully developed. Stale eggs, to be hatched by a hen or in an incubator, must be subjected to a low, slowly rising temperature. This I have proved repeatedly to my own satisfaction.

All eggs, at a certain period after incubation has begun, should be tested for fertility. Night time is most convenient, and there is more leisure to do so then with most of us. A common Bismarck lamp, without the shade, is very suitable. Procure a piece of cardboard about 8 in. square, and in the centre cut an oval hole—not an ellipse—rather smaller than the average egg. Have the lamp glass clean; then hold the egg to the cardboard and approach the lamp. With eggs not more than a week old when set, and white shelled, the germ is easily discerned by persons of average sight after 84 hours; a day or two later may be needed for tinted or brown eggs. The embryo will then appear somewhat like a red spider with a well-defined semi-opaque nucleus, and the branching blood vessels are readily seen. Further examination will reveal decided movements, which should always be looked for. A stationary embryo denotes something wrong, and when it is stationary and quivers when shaken it is evident life has ceased. An infertile egg is clear, and has no spider-like embryo visible. Round blood rings denote infertility, among other features. As a rule the air sac will be seen at the larger end of the egg, although occasionally it is placed elsewhere. The size of the air sac when the egg is set denotes its age—the larger the staler the egg. After incubation, if the air sac increases in size to a marked extent, it shows lack of external moisture and undue evaporation of the watery contents of the egg. Up to the fifth or sixth day infertile eggs can be used for cooking, but should not be left unused for many days. Where three or four hens are set at a time, and there are many infertile eggs, the remaining fertile eggs can be taken from one hen, and the other nest given full complements. The odd hen can then have a fresh clutch. Do not add eggs after the term of incubation has begun, and do not set duck and hens' eggs in the same nest.

Turkeys make fine natural incubators, and may be kept at work for several months without in any way incommoding or injuring them. A large semi-darkened coop is required for them. If not broody (as long as it is a hen that has laid and not a maiden pullet), give the hen a glass of port or a tablespoonful of whisky and water at night, and put her in the coop on some dummy eggs; darken the coop, and leave her till next night; in the majority of cases she will be found sitting. Then she may have, according to her size, from 15 to 25 eggs; a medium-sized hen is the best. Hens and turkeys in coops should leave their nests daily for a feed, a dusting, and to relieve nature, and to cool the eggs. If they refuse to quit they must be grasped firmly by the legs and body and lifted sideways or backwards from the nest, taking care that no eggs are caught and broken. Turkey hens often refuse to eat after a time, and must be fed with pellets of meal mixed in a stiff paste dipped in water and forced down her throat. This is often a troublesome affair. During the absence from the nest an examination can be made and any broken eggs removed, and soiled eggs cleaned with warm water, and at once dried with a clean soft rag. As a general rule a sitting hen can be left severely alone; but with quiet hens, where numbers are sitting, such a method of procedure, as suggested, is required. Do not sprinkle the eggs with water; the effect is a sudden chill, due to evaporation of the moisture, hastened by the warmth of the eggs. In very dry weather the ground round the nest may be damped occasionally. When the term is ended the hen should be left undisturbed to complete her hatching. If she is restless the first evening all chickens hatched may be removed and placed in a box lined with warm material, and placed in a warm spot. For 20 hours or so after hatching the chick, duckling, &c., requires no food, as Nature has provided for that period.

Tanning Skins with Fur On.—Chop up some wattle-bark finely, and boil it in a copper to extract the tannin. Pour the liquor into a tub, and when it has cooled throw in the skins and let them lie for a week. Then take them out, spread them on a slab, scrape the flesh off, and trim them. Then put them back into the tub for another week, after which wash them in clean water, and peg them, flesh side out, in a shady place to dry. If they become stiff rub them well between the hands, and pull backwards and forwards across a smooth pole.

COLD STORAGE OF EGGS.

By R. W. Skevington, Manager Produce Export Department.

Regarding the after effect of cold storage on eggs, there is a great deal of misconception, which entails almost daily controversy. A general opinion prevailing is that eggs, after removing from the chamber, will very shortly go bad. My reply is—given the proper temperature, everything in the egg is held in suspense; it undergoes no change whatever, whether by evaporation or aught else, and if new laid when put into the chamber, will, when taken out, keep good the usual three or four weeks in winter, and a shorter time in summer, or, in other words, if fresh when eggs are put into the chamber they will be fresh when taken out.

For the information of farmers and others desirous of placing eggs in cold storage during the summer months the following directions and regulations are published.

Directions.

In order that eggs may be kept fresh and good for from four to six months it is necessary to see that only new laid ones be selected; where possible also it is advisable to have them infertile, as when fertile eggs get exposed to a temperature of 98 to 100 deg. for even a short period, the germ will start into life and no subsequent treatment will then avail to give them the quality of freshness. Eggs for storage should be gathered every morning before the sun has gained strength, and placed at once in the storage boxes in a cool place. To attain the highest success, they should be graded as to colour and size, the boxes being marked accordingly. Care should also be taken to have the eggs perfectly clean and free from unsightly stains. The boxes used should be of the ordinary trade size, holding 36 dozen, and packers should see that they are made of odourless timber, as eggs are peculiarly liable to absorb flavours from their surroundings. Another important point is to see that the boxes and fillers are thoroughly dry before using, otherwise mustiness is almost sure to ensue. Beyond the "fillers" of tasteless cardboard, no packing of any kind should be used, as the natural moisture exuding from the eggs should be allowed to escape, otherwise a musty flavour is likely to be perceivable when the cases are opened. Eggs for storage should be forwarded as soon as packed, by quick train or steamer, and handled on the way with the greatest care.

Regulations.

1. All eggs forwarded for cool storage must be sent, carriage paid to the Port Adelaide Depot, and a postcard or letter advising dispatch to the manager's office, Adelaide, at time of forwarding.

2. The cases will be received and stored on the owner's account, and at his sole risk, and the Government will not be responsible for any loss or damage said to have occurred while the eggs are in store, from whatever cause arising.

3. Store receipts will be issued to the owner, or his agent, when the cases are deposited, and delivery will only be made on production of such store receipts and payment of all charges for handling and storing, as per schedule herein.

4. Cases must be of the kind known as "patent packers," each holding 36 dozen properly packed in cardboard "fillers."

Value of Cold Storage.

Thousands of dozens of eggs have been stored at various freezing works on behalf of various owners, with the result that all those conforming to the above condition were found perfectly sound and fresh at from four to nine months from date of storing. The advantage of storing is that when eggs are at their lowest they may be put away and kept until markets reach their highest, when a profit of from 50 per cent. to 100 per cent. can be realised after paying all expenses.

CHARGES.

Receiving and delivery	3d. per case.
Storage per week	3d. per case.

Note.—This means that eggs can be stored for 11 weeks at 1d. per dozen.

These charges are payable on delivery.

Packing cases and fillers complete may be purchased at a cost of about 2/6 each.

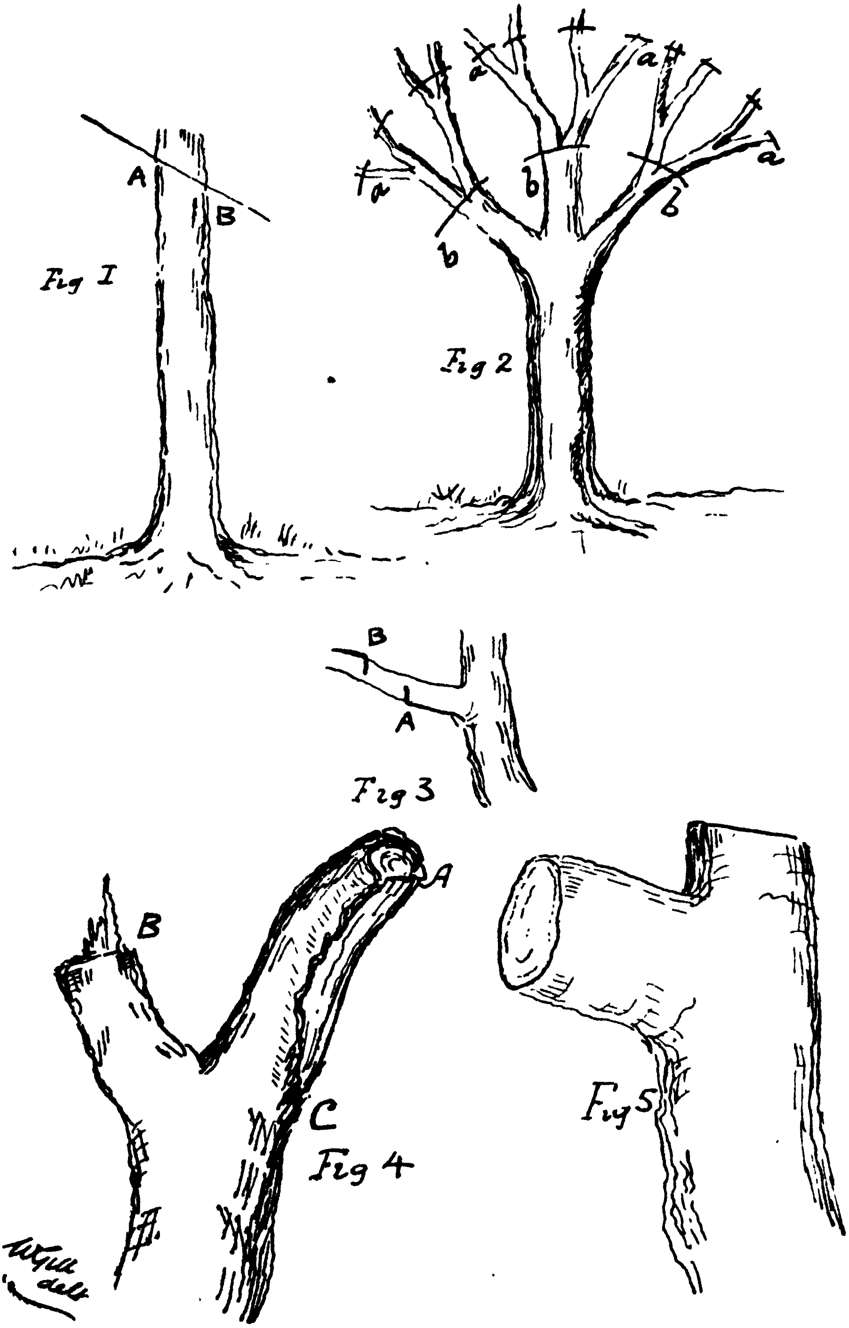
POLLARDING TREES.

By WALTER GILL, F.L.S., F.R.H.S., CONSERVATOR OF FORESTS.

Having on a previous occasion dealt with the question of "pollarding" in its general aspects, I now propose to go more into particulars as to how and when the work may be done to the best advantage. The desire being in most instances to secure new growth as soon as possible, the most suitable time for pollarding, it is evident, will be that in which the tree may usually be expected to shoot out most quickly. The same time may not, however, suit all trees. If we take the gums under consideration we find that under ordinary circumstances they begin to start more vigorous growth in the spring, and are usually in good growing order in the summer time, though probably they may in some places, where conditions have been favourable, have been really growing more or less all through the winter. There seldom seems to be a time when gums are really dormant; this question, however, though interesting enough, is only connected to a certain extent with the subject under immediate consideration, and is referred to in order to show that any statements made regarding the growth of gums at any stated time are open to modification in accordance with special conditions in particular places. It may be inferred from this that the best time for pollarding in one district may not be equally suitable in another. Therefore, every one must consider what the conditions under which his trees grow are, and act accordingly, if it should seem that any alteration may be wise in the suggestions now made. They are given on the broad basis of the "greatest good to the greatest number," and therefore deal with the conditions generally prevailing.

With a view to closer observation I have on several occasions pollarded sugar gums growing on my own land in Malvern, a suburb south of Adelaide. The soil here is a stiff clay loam, with a good retaining subsoil, and gums grow exceedingly well. The quickest results have undoubtedly been secured in the hot summer months of December, January, and February; then the young growth speedily begins; whereas when the trees are pollarded in the autumn it is much later before fresh shoots appear. In a stiff land of the kind now referred to warmth is well maintained in the summer, whereas in the winter it is not. Where soils are lighter in character, like very sandy soils, and are overlying a porous subsoil, they may be quite warm enough in the winter time to promote fair growth during that period. The winter would also probably be the best time for an adequate supply of moisture to be expected, especially if the rainfall is uncertain; these conditions would therefore point to the autumn months as suitable for pollarding gums in districts of this character. Between these two examples many variations may occur which those possessing the necessary local knowledge should be able readily to deal with. In most cases it will be found better to start in the spring and summer rather than to delay till autumn, as it must be remembered that whereas the fresh tender growth of spring will soon experience the warmer weather in which the gums generally thrive, the young shoots starting in the autumn, though frequently able to grow steadily all through the winter in many places, and under some of our atmospheric conditions, may at any time in our uncertain climate be exposed to a hard frost that may cut them hard back, and either destroy the tree entirely or severely check the young growth.

Another matter of importance is that the limbs and trunk of a tree are less exposed to injury from damp after being pollarded in the spring and



POLLARDING TREES—HOW TO CUT AND HOW NOT TO CUT.

summer than when cut in the autumn, as much of the cut surface may be healed over in many cases before winter rains come, whereas when cut in autumn they have all the winter to go through.

If trees require pollarding because they have been injured by heavy winds, they must of course be cut clear of broken limbs at once whatever the season may be.

Turning to the question of the way in which this work should be done it may be stated at the outset that in most cases where trees are pollarded the operation is carried out in a manner highly injurious to the trees. Invariably one sees no care whatever taken to prevent the tearing off of bark, and the fracturing and splintering of timber itself. The operator begins in most cases to chop with the axe, or to saw, on the upperside of the limb, then, as he cuts through, the result is that the weight of the branch, acting with increasing power as the cut gets nearer the lower side of the limb, tears off a big strip of bark, some way down the part of the limb still remaining on the tree, and also breaks away some of the wood, leaving behind a splintery rough wound that will never properly heal, and will in all probability soon make the tree an easy prey to some of the minute but insidious foes which do such great harm to arboreal vegetation. This is simply barbarous to any one having an intelligent acquaintance with proper arboricultural methods. In all cases when dealing with any limbs or even smaller branches growing at any angle out of the perpendicular, the proper way is first to make an undercut for a short distance, and then to cut on the upper side a little farther from the main trunk than the undercut. This prevents the tearing away of any part of the limb and the laceration of the bark, and after the main bulk of wood and foliage has thus been cut off, the small part remaining between the two cuts can easily be cut off in such a way as to leave a clean evenly cut surface, surrounded by a well-trimmed bark that will readily admit of the wounds being healed in the quickest possible manner, and result in an even growth of young shoots. In pollarding the main trunk of any tree as a single stem the cut should not be made horizontally at right angles to the ascending axis. This would expose a level surface, and on this when rain fell water would rest for a longer or shorter period, some of which would ultimately soak down into the cellular structure of the wood, and thus pave the way for the formation of a favourable "nidus" or resting place for the spores or germs of the different fungi which do so much harm to timber.

If, however, the cut be made in a slanting manner, the rain will run off from the surface thus formed if it be even and smooth, and in this way lessen the danger of decay, already indicated.

In figure 1, the position and direction of the cut suggested, is indicated from A to B. Figure 2 gives a rough idea of a suitable shape for pollarding a tree where the branches are treated and not the main trunk. Cutting them at a, a, a, will give a wider head, and at b, b, b, a closer; the selection of the position is a matter of opinion for the owner of the trees. Figure 3 shows where the undercut should be made at A, and the top cut at B. Figure 4 shows a tree butchered not pollarded. Ths is not a creation of a vivid imagination but has been copied by the writer from an actual tree stump standing in a suburb of Adelaide, as a striking monument to the genius of the operator. B and A indicate points where the commonest faults of topping or pollarding occur, the bark having been all torn off from A to C, and splinters left at B. Figure 5 shows how the tree should be left if properly treated. In a few instnces a really skilful man may make a good job of this kind of work, with a light axe or a long-handled tomahawk, but as a rule a good saw will do the work far better. The removal of the higher limb first is a step of common prudence that needs no amplification, and the use of a strong rope will at once suggest itself to a practical man as a valuable aid in easing the fall of the detached limbs, when fastened to others conveniently situated. As a useful dressing after cutting, coal tar should be applied, especially on the larger cut surfaces. Its antiseptic properties tend to preserve the wood, and also act as a deterrent to insect and fungoid pests. In a few cases it may be replaced by good paint with advantage, however, but for gums it does well enough Much more could be written on this point, but the object of these remarks has been to simplify the matter as far as possible.

EXPORT OF APPLES AND PEARS.

Mr. E. Burney Young reports as follows on the apples and pears shipped to the London Produce Depot last season:—

"As I have already mentioned a considerable quantity of the apples were very small, though their condition was generally pretty good. Some of the pears arrived in good condition and realised from 20/ to 25/, but the average is very greatly reduced by the large proportion of pears which arrived in bad condition, many cases being worthless. A similar fate befell the grapes, those which arrived in good condition realised 16/ to 18/, but a large quantity arrived in very bad condition owing I presume to their being packed a little over-ripe, as some grapes by the same ships arrived in good condition, and there was no fault to be found with the packing. I noticed some faults in the grading of the apples which growers should be careful to avoid, large and small apples should on no account be packed together. Some buyers require only medium sized apples, and they would give more for a case containing all medium size than if half the apples are large. In a similar manner those buyers who wish to have fine fruit do not want the smaller, consequently the sale price is spoilt for both classes of buyers through improper grading. The long shaped case for packing seems to be preferred on the market to the shorter and wider case, and as the South Australian apples have usually been packed in the long cases it would be better to adhere to them."

The following table gives particulars of the prices realised by the different varieties of apples and pears shipped through the depot:—

Apples

965 cases of Cleopatra averaged 12/.
623 " Dunn's Seedling averaged 12/8.
427 " Stone Pippin averaged 10/7.
427 " Rome Beauty averaged 11/2.
258 " Reinette du Canada averaged 8/3.
213 " London Pippin averaged 10/8.
138 " Jonathan averaged 11/4.
109 " Rymer averaged 9/.
82 " Sturmer Pippin averaged 9/11.
78 " Dumelow Seedling averaged 12/9.
75 " Strawberry Pippin averaged 10/.
60 " Bismark averaged 9/1.
58 " Five Crown Pippin averaged 9/8.
52 " Winter Majetin averaged 7/11.
50 " Shockley averaged 13/.
470 " of different kinds in small lots brought from 15/ per case downwards, some kinds averaging as low as 6/1 per case.

Pears.

203 cases Vicar of Winkfield averaged 6/7.
20 " Glou Morceau averaged 12/11.
7 " Uvedale St. Germain averaged 8/3.
4 " Winter Nelis averaged 5/6.
1 " Josephine de Malines averaged 8/.

Poisoning Foxes.—Foxes are not so easily poisoned now as they were a few years ago. A good plan is to kill a lamb, and cut off baits, being careful to use a fork, so as to avoid handling the bait. Poison each bait with a small quantity of strychnine. Then take the head of the sheep, singe it well in a fire, and have it drawn along the line you want to poison; follow closely with the baits, dropping them in tussocks or ferns, or rough grass, so that the crows may not find all of them. The fox will follow the trail of the singed sheep's head, and is nearly certain to pick up the poison.

SPRAYING TESTS FOR CODLIN MOTH.

During the month the Chief Inspector of Fruit has completed arrangements in connection with the proposed demonstrations of the efficacy of arsenical spraying for the suppression of codlin moth. The following orchards have been accepted for this work:—

A portion consisting of about 5 acres of Mr. Elliot Hannaford's apple orchard at Chain of Ponds. These trees are about 18 years old, and are typical of the orchard trees as grown in the hills. At Houghton, part of Mr. Marinus Maughan's sixteen-year-old apple plantation has been secured. A strip of about 3 acres will be sprayed through the middle of the block. These trees are grown somewhat under the height of the average hill's apple tree. They are clean-stemmed and well attended, but notwithstanding this the fruits were badly affected with moth last year, and the owner calculated that quite half the apples were infested. This orchard is alongside the main north-eastern road to Gumeracha, and easy of access to those interested. Besides this, it is located in the centre of a large area planted with apple trees. At Summertown the orchard of Mr. E. W. Percival has been secured. There are slightly over 300 trees of pear, apple, and quince in this garden. They are comparatively large trees, and rather higher than one would wish for rapid manipulation, but they will doubtless receive a thorough treatment. This orchard is also admirably situated to enable a large number of applegrowers who pass along this road to the city markets to see the results without loss of time. At Forest Range, another rising centre in fruit production, about 2½ acres of Mr. J. Vicars' well-kept orchard, will be treated. These trees are growing in rich land, and have made splendid growth, and produced much fine fruit. They are well attended in respect to scraping, bandaging, &c. At Piccadilly Mr. Shantz has placed a portion of his orchard at the disposal of the department, and his usual methodical painstaking habits will doubtless ensure accurate results in the end. The trees are larger than should be grown where codlin moth has to be combated, but Mr. Shantz has paid good care to the cleaning, &c. This is located in the middle of a large applegrowing district where the showery conditions cause the Fusicladiums to be very destructive, and it is proposed to use a combination of Bordeaux mixture and arsenite of soda.

In the Stanley district the codlin moth pest is pretty widely spread, but on the whole the orchards are as yet but lightly attacked. At Penwortham Mr. Charles Beaumont has arranged to spray three plots, each containing about 50 apple trees, which have been selected from the worst infected portion of his orchard. These trees are wellgrown, and in full bearing, being about ten years old, and consist of most of the best export varieties. At Stanley Flat the orchard of Mr. J. Christison has been offered, and one plot containing about 120 wellgrown apple trees has been chosen as typical of the whole. These are clean-stemmed, wellgrown specimens of ten-year-old apple trees, and as yet are but lightly infested with the moth.

In the Angaston district a portion of the orchard of Mr. Walter Sage has been secured. Mr. Sage was one of the pioneer "sprayers" for fungus diseases in South Australia, and doubtless will carry out the work very accurately. The trees are wellgrown, and of normal size, for the district. They have been carefully scraped, and the orchard receives good cultivation.

In all eight experimental plots will be treated, and in each case a fair number of varieties have been included. Arrangements have been made with a wholsesale firm of chemists to prepare the stock solution of arsenite of soda, and its purity, though guaranteed, will be tested by the Departmental Analyst. Full instructions will be given in print to each experimentor, and personal supervision in the carrying out of the work will be given either by Mr. Quinn or some of his officers as far as practicable.

In each instance a local committee of fruitgrowers will be asked to watch the progress of the work, and give an independent report at the conclusion of the tests. The owner in each case will be supplied with a book in which he will be asked to record the dates of each spraying, a short account of the weather prevailing at the time of applying, and during the intervals between the sprayings. The weekly gatherings of fallen fruits will be carefully sorted. and a record kept of the quantities of moth-damaged and non-infected specimens thus collected. At the harvesting of each kind a similar record will be kept. It is proposed to apply not more than five sprayings, and the usual bandaging system will be followed. In each block a number of check trees will be left unsprayed, but these will be bandaged in the ordinary manner, as it is deemed desirable to show what advantage the spraying gives over the bandaging system now in vogue. The fruits from these trees kept as checks will, of course, be recorded quite separately from the rest, and in each case average trees of each variety in the block will be selected as checks. The reason small areas have been selected is because accurate records of the numbers of moth-infected and sound fruits are absolutely necessary if reliable conclusions are to be drawn from these tests. As the owners have arranged to gather up and do most of the sorting in connection therewith it would not be fair to ask them to undertake the gigantic task implied in dealing with the produce of a large

MILDURA NOTES.

To be isolated and cut off from railway communication by 150 miles of bush roadway, has been the usual experience of Mildura during the winter months of low river level, but river communication has hardly been restored at all this season. Storekeepers' stocks have run very low, and fodder has been at famine prices. Fortunately the bulk of the dried and citrus fruits have been got away. The citrus crop was a very short one, otherwise there must have been a great amount of fruit left to waste. Citrus prices have been excellent, very much better than those prevailing during the previous two seasons. The carry-over of the 1901 raisin pack has been disposed of, and prospects for the speedy sale of this last season's fruit are good. The Victorian Engineer-in-Chief, Mr. Rennick, announces the expected completion by the new year of the Mildura line as far as Lake Hattah, about 40 miles from here, and anticipates extension to Mildura by about next April.

Mildura having been declared free from phylloxera, the prohibition of the importation into the district of vines and trees from other parts of Victoria has been obtained at the instance of the local Horticultural Society. Under the auspices of the same society experimental nursery plots for American resistant vines have been established. To minimise risk of introducing phylloxera along with resistant vines, cuttings only were introduced, 100 of each of various kinds, and it is proposed to raise sufficient vines from these to gradually supply the requirements of the settlement. At present the work is purely experimental, and an endeavour will be made to ascertain species and varieties best suited to the varying conditions of soil within our settlement area.

Papers have been contributed to the Horticultural Society during its winter session, by Mr. H. E. Barnes, urging the necessity for closer co-operation among growers for the profitable disposal of produce; by Mr. Grossmann, giving the result of observations on the fruit industry made in the course of a tour round the world; and by Mr. M. J. Paul, a former orangegrower and merchant of Jaffa, on the cultivation and marketing of citrus in foreign parts. In this paper the formation of a Citrus Growers' Association, for the regulation of the market supply of the fruit, was advocated. Various pruning demonstrations were given during the winter by arrangement of the society. Great interest was shown in the sultana pruning. The two methods most in vogue here are the rod-pruned Thomery spalier and the Sylvoz cordon. Among growers of experience opinion is very strongly in favour of the former, achieved results showing that it is the better adapted of the two for the production of early crop from young vines, and that returns are heavier than from the cordon. For the Zante currant, on the other hand, the spur-pruned cordon has been proved to be the simplest and best paying method out of many tried.

There has been little planting this winter except with sultanas, and some hundreds of acres of these vines must have been planted. The supply of nursery stock, in this line, proved to be altogether inadequate to the demand.

Not much hay is grown here as a rule. This year about 600 acres are under crop, and most of it looks exceedingly well, and will shortly be ready for cutting. About two tons per acre is an average crop here. Owing to the great shortage of fodder there has been a lot of planting done in drills among young vines this season. A certain amount of wheat and oats has been put in during the last month, after the winter watering, which ran through July and August. Barley has not been obtainable of late, and the maize supply has been very short, maize commanding as high as ten shillings per bushel. The spring pumping starts in the first week of October.

ORCHARD NOTES FOR OCTOBER.

By Geo. Quinn, Horticultural Instructor.

Although at the present time the trees hold out no signs of distress, every fruitgrower knows only too well how deficient in moisture his subsoil is. To enable the trees to carry their crops to maturity requires much moisture, but to enable them, either simultaneously with or after the crop is gathered, to develop good healthy wood on which the crops of the succeeding season must be borne, demands a much more abundant supply. The season, in many parts of this State, has become so far advanced, that if the past is any guide, not much more soaking rain can be anticipated. The sun is powerful now, and evaporation rapid, so that the penetrating action of spring or summer showers is far less than a similar fall during the cool clouded days of winter. In pretty well all parts of the State the surface of the soil which has remained roughly dug or ploughed should now be broken down with the cultivator into a fine tilth. The finer the particles composing this tilth the more will the loss of moisture be stayed; the more crusty or cloddy it is allowed to remain, the more rapidly will the moisture pass from the subsoil into the air. Experimental tests have shown that if this stirred layer of pulverised soil be made four or five inches in depth the check to evaporation is increased. During these dry seasons there is no side of orchard work demands more attention than this subject of conservation of soil moisture. If, by exercising the means indicated above, we store up all the available rainfall during winter and do all our knowledge can suggest to arrest its escape as the warm days of spring and summer come around, we must secure the greatest benefit to our trees from the possibilities at hand. A supply of moisture, which is constantly retarded as it rises to the rooting area, will yield a natural and regular supply to the tree, and permit a steady progressive movement throughout its organs. It also tends to keep the roots down in a layer of soil where more equable conditions prevail. Its action is continuous and not spasmodic, and in this it differs from any supply of moisture applied by surface irrigation during the season of enormous evaporation which marks our summer months here. It also possesses the advantage of maintaining a much more desirable texture in the soil as far as its physical characteristics are concerned. The implements used in keeping this mulch intact and loose should not turn or ridge the surface. Although it is desirable to retain a flat surface exposed to the air, the under surface of this mulch should be as irregular as it is possible to make it. The use of a harrow or cultivator, whose teeth travel to an even depth through the soil, tends to form a flat, hard subsurface—a temporary "hard pan"—which may become permanent unless the succeeding winter cultivation be deep and thorough. Flat-soled tines will produce this effect very quickly, and are now being discarded by many orchardists.

As the young growths upon newly planted trees lengthen out, careful attention to disbudding will prove useful in shaping the body. A good rank growth is desirable on all such trees, as every leaf indicates increased health and strength. The absolute suppression of shoots is scarcely desirable at this period, when we are anxious to re-establish the balance which prevailed before the tree was removed from the nursery. Unless they are very crowded together the shoots not desired in framing the arms of the tree should therefore only have their terminal sappy points pinched out. This will give a temporary check to them, and allow those more desirable to get a good lead. As often as these undesirable branches appear to menace the supremacy of those selected to form the tree, they should be pinched in this manner. At the succeeding winter's pruning these may be entirely removed or treated to turn them into fruiting wood. As there has been much severe pruning done among trees of a mature age during the past winter, strong growth must follow as a matter of course. If time can be spared to go through and pinch back those best situated and carefully rub out the surplus shoots while they are yet sappy, the energies of the tree may be directed into useful limbs, and much winter pruning avoided. Unless these lopped trees are carefully thinned during the next season or two their future condition will be worse than the past. Much "pitted" fruit may be expected upon apple trees where the varieties subject to this disease have been heroically pruned.

The novice need not hesitate to transplant citrus trees, passion fruit vines, or guavas at present, providing general care is observed. In connection with the citrus trees the young sappy shoots should be pinched or cut off before the trees are lifted. The intimate connection between these extremities of the top and the feeding outside fringe of the roots which will be broken in the shifting, renders their removal imperative. To ensure success the top should be cut back in proportion to the loss of roots. This loss is not to be gauged by the actual quantity cut away, but the condition of those remaining should be fully considered. Even though the soil be rich the planter will find much to be gained by spreading some thoroughly decayed farmyard manure around the roots. If this is not available a slight sprinkling of sulphate of ammonia--2 or 3 oz. mixed in with the finely broken soil which will be placed around the roots will prove a fairly good substitute. The organic manure is preferable on account of its moisture-holding character. All trees should receive a good watering immediately on being set out, and as soon as the soil is dry enough to be worked the watering trench should be forked up and the dry soil spread in again in a finely pulverised condition.

It is a good time to bud over large citrus trees that have proved unprofitable. In California much success has followed this work when done on a large scale. The practice adopted there has been to insert the buds into the main arms near to their junctions with the stem. The buds are put in in spring. They are not pushed down into the matrix made in the bark, as is done in ordinary budding, but are pushed up into a matrix made by making the T-shaped cut upside down. The wounds and buds are covered with waxed bands, such as we adopt in grafting. After the buds "take" the tops of the limbs are removed. Sometimes this is done at once, and the trunks and stumps are whitewashed against sunscald. Others prefer removing the tops gradually. The buds are taken from rounded shoots, and triangular wood or thorny buds avoided.

In late districts grafting will be carried out by ordinary methods, where scions are procurable. Bark-grafting is usually the most successful method to follow at this somewhat late period. Although not generally practised, there is no reason why, with the exercise of proper care, woody scions should not be cut and inserted during the growing season, as buds are cut and inserted. The drawback to bark-grafting is the ease with which the growing scions are broken off during the first two or three years. This difficulty may be overcome by fastening a stake to the old stock, so that it stands up against and parallel to the scion. To this the growing scion is tied securely, and should be kept tied for two or three seasons. A good secondary help is found in pinching out the growing points of the shoots on the scion from time to time. This gives a temporary check, and increases the robust character of the growth. If not done the shoots grow top heavy and sway about, thus increasing the danger of dislocation. In the case of large stocks, a good number of the shoots arising therefrom should be retained for a season or two. They will shelter the stem from the sun, assist in an equal diffusion of sap, and thus keep all parts alive and healthy. They also assist in the vegetative functions of the tree, enabling the top to utilise the large root system and keep it alive and active. If they tend to overreach or outgrow the scions then judicious pinching should be reverted to from time to time. The healing over of wounds upon the stock is most important, and they should be dressed annually with paint or wax to keep out decay until the growing callus envelops them.

The spring season starts many garden pests into activity. Until the dry, settled, hot weather sets in the black aphis of the peach will be likely to cause trouble. These insects are very troublesome owing to their rapid breeding habits, and to the difficulty of bringing any spray into direct contact with their bodies after the leaves afford them shelter. There are several well-tried spray washes, viz., kerosine emulsion, resin wash, and tobacco and soap wash being most generally used. Of these I prefer the latter, as the materials are obtainable anywhere, and the method of manufacture simple and rapid. An ordinary stick of strong black tobacco and about double its weight of common soap will make a kerosine bucketful (four gallons) of very effective wash, if boiled together in the usual way. This kills by contact only, and must be thrown upon the insects. Either of these washes will kill, but the secret of success lies in several sprayings being given in quick succession.

The black and red scales of the citrus trees will start into active operations. The former frequents the midribs of the leaves to a great extent when in the flat reddish-brown stage, and as a rule their presence is indicated by the sooty appearance of the foliage or by numerous ants crawling about the tree stem. The resin wash or kerosine emulsion will kill these young black scales very quickly, and the soot will peel off naturally in time. These black scales and the olive green aphides are often responsible for the curling disfigured leaves found upon the orange trees, and they often absorb the nourishment from the young tips, which should go to develop the flowers for the coming season's crop. The red scale is more difficult to destroy, and if resin wash be used as a spray better results are likely to be obtained at a later date, when the insects are more generally on the move. No doubt, in the course of time, the fumigation tent and the fumes of cyanide or some other deadly gas will replace these washes in the destroying of all suctorial insects that attach themselves to the trees. It is far more thorough in its action, but at present the outlay for tents, &c., debars many from adopting these means.

In wet localities, or should the spring prove showery, the apple, pear, and apricot fruits will be kept much cleaner from fungus "scabs" if a second application of Bordeaux mixture be made. The strength should be weaker than that used when the trees are devoid of leaves. It is also of greater importance to use only perfectly fresh quicklime at this stage, otherwise the leaves will be burnt and the fruits "rusted." A strength of 1 lb. of bluestone and 1 lb. of fresh lime to each 10 gallons of water will not do injury to the foliage if these precautions are taken.

There is great promise of a general trial being given to the arsenite of soda spray for the destruction of codlin moth during the coming season. This is dealt with in a separate item in this number. No time should be lost in removing and cleansing old bands and scraping off rough bark, cutting off projections from broken limbs and other winter refuges for injurious insects. The fruit store should also continue to receive attention in the direction of securing the moths before they escape into the open. The general lowering of the height of the trees, which has been undertaken almost throughout the State during the past winter, is a very important step in the direction of controlling this pest. With trees of a manageable height, by means of spraying, bandaging, and picking infected fruits as far as practicable early in the season, there is much hope, that, favourable as the climate may be to its propagation, this pest will cease to be the bugbear which has filled our applegrowers with apprehension for years past.

Lampas.—This is not a disease.—It is merely a swollen condition of the palate bars, immediately behind the upper incisors, and is the natural consequence and accompaniment of teething. For treatment, the gums may be scarified with a lancet, but this is not always necessary. Very often a few bran mashes, with a little common salt or nitrate of potash, will effect a cure; or you might try rubbing on a little dry burnt alum after giving the horse a dose of laxative medicine. If anything more is required, allow the animal ½ oz. of bicarbonate of potash in his drinking water twice daily. The old practice of burning out lampas is now a criminal offence in most countries.

NOTES ON VEGETABLE GROWING FOR OCTOBER.

By Geo. Quinn, Horticultural Instructor.

On the open plains country the attention of the vegetable grower is now turned to the sowing and planting of summer crops. In the deep gullies of the hills the soil is only sufficiently dry and warm to permit planting similar vegetables to those grown on the plains during the winter and early spring. Without appliances such as glass frames, or other warmth-collecting structures, being placed around each plant, it is little use sowing or planting melons until the temperature of the soil begins to rise to an appreciable degree. Melons thrive best in soils rich in thoroughly decomposed organic matter. A good compost for them is made by throwing all kinds of vegetable substances, such as weeds and grass clippings, mixed with droppings from animals, into a pit and allowing the mixture to decay for a season until it will cut out black and firm. Failing this, well rotted farmyard manure should be secured. Melons sometimes prove profitable on lands from which a crop of some kind has been taken, which received a heavy dressing of manure at its planting time. There are two methods commonly adopted in preparing ground for melons. One consists of digging holes, into the soil of which the compost or manure is worked. The second consists of spreading the manure in strips five or six feet wide and digging or ploughing it into the ground. The seeds are then sown in the holes or in drills along the strips which received the dressing of manure. The latter method would appear to meet the rambling habits of the roots, because they spread almost as widely as the creeping stems above ground. Three or four seeds should be placed in each spot, and these may be from three to six feet apart according to the trailing habit of the variety. As soon as the seeds are sown they should be covered with broken decayed manure or sand, and the surrounding surface made loose and fine.

Edible podded beans—commonly called French beans—should be sown now. These like a well prepared loam formed of a fair mixture of sand, clay, and organic matter, with a fair proportion of lime included. If the soil has become dry, give it a good soaking several days before digging it. Sow in drills say one foot apart, with the seeds dropped from two to six inches apart, just according to the germinating power of the seeds. If a large area is to be sown it may be worth while taking a couple of dozen seeds indiscriminately from the stock, soaking them for several hours in water which was pretty hot when poured over them, and then placing the seeds between the folds of a bit of damp blanket in a warm room to germinate. It may be necessary to damp the blanket each day. By this test much disappointment may be avoided if the seeds are of an unknown age. The whole of the seeds may be soaked if a rapid germination is desired. In such a case they should be allowed to stand for an hour or two after the water is poured off. This allows the testa or skin to toughen slightly, and without such a precaution the seedlobes may break asunder while being handled from seed vessel to the soil. Before sowing the seeds sprinkle a little superphosphate in the drill to help the plants later on. The seeds should be covered with some loose compost—a mixture of fine manure and sand is good—to a depth of about an inch. If the soil is fairly moist no water should be applied until the plants appear above the surface.

Among the dwarf kinds suited to the open dry country the Canadian Wonder is still a favourite. It gives a good pod but takes a long time to come into bloom. The Emperor William and Dwarf Caseknife are more rapid. It is a good plan to sow a few rows of each kind at the same operation, as they will then come on in fair rotation.

Although tomatoes may be sown in the open ground, such a practice is not advisable excepting late in the season. The young plants when set out should be sheltered from the cold winds. A very ingenious shelter is made by cutting a kerosine tin into two parts in a diagonal direction and lengthways, leaving the square top of the tin on one piece and the bottom attached to the other. In the angle a stake is nailed which projects below the open end or bottom of the tin. This projecting stake is forced into the ground and the tin forms a shelter wall on two sides and on top. The stake is pulled up gradually as the growing top of the plant rises under the tin. Tomatoes do not prove profitable if grown in soils very rich in organic matter. A moderate quantity is valuable, but much increases the vegetative portions of the plant to the detriment of fruit setting. Potash and phosphates are valuable, and these may be given in the forms of superphosphates, woodashes, or muriate of potash.

In small gardens in hot dry localities, where water is available for irrigating, silver beet may be grown throughout the summer. It is a good substitute for spinach or cabbage, and will thrive at a time of the year when these cannot be produced in an ordinary garden. Sow the seeds in drills, enriching the soil with organic manures. The red beet is also a good summer vegetable, and may be produced in most gardens throughout the year by making sowings in selected spots. The turnip rooted varieties give the best results in the hot months, as they grow into a useful size more rapidly than the longer and deeper rooted kinds. These like a loose soil which has been dressed heavily with farmyard manure the season before. Fresh manure causes them to send out too many secondary roots.

Growing crops of potatoes should be hilled up, or the soil loosened between the rows. The surface of the soil between all growing crops should be forked or hoed up as much as practicable to kill weeds and conserve moisture.

Watch all tomatoes and melons growing under shelter for the appearance of aphides. Curled leaves usually indicate their presence. If found, spray the under sides with weak soap and tobacco wash, and give fresh air and encouragement to the plants to make good growth.

Look to the saving of seeds from cabbage and cauliflower plants.

Do not be too hard on asparagus beds unless the plants are exceptionally strong. A good dressing of superphosphate and kainit, covered by a mulch of decayed farmyard manure will help the plants to make a strong recovery after the cutting season.

Rhubarb plants would be much strengthened by the addition to the soil of a good dressing of superphosphate, combined with a little sulphate of ammonia, more particularly if in dry places these can be washed well into the ground by irrigation. A top dressing of rotted stable manure will also prove very valuable under such conditions.

HOW TO AVOID THE NECESSITY OF DIGGING UNDER FRUIT-TREES.

By E. F. McBain, Coonowarra.

It is not my intention to deal exhaustively with the cultivation of fruit-trees, but simply to detail that part of the subject which, so far as I am aware, has hitherto not received the attention which it deserves.

The usual practice followed in the cultivation of fruit-trees is to give a good ploughing in one direction between the rows of trees—ploughing as close to the trees as possible—and then cross ploughing at right angles to the first. This method usually leaves a piece of ground under each tree about 8 or 10 ft. square, which has to be dug with the spade. If we take an average of 8 ft. square under each tree in an orchard of 80 acres, such as we have at Coonawarra, there will be about 12 acres left for the spade. To dig 12 acres with the spade under the branches of the trees and in sticky soil is a serious undertaking, and it was to avoid this hand labour as far as possible that I invented a simple method by which practically the whole of the ground in an orchard can be cultivated with the plough and scarifier, and thus reduce hand labour to a minimum.

All that is necessary in addition to the ordinary orchard implements is a reversible plough and a long beam.

Assuming that the trees are planted in rows 20 ft. apart, first of all procure a 6 in. x 2 in. oregon beam 18 ft. long. Then get a reversible plough for the right-hand side, and an ordinary South Bend plough for the left-hand side, and fasten these to each end of the beam by slipping the loop of a chain over the end of the beam, and attaching the other end of the chain to the plough, about 3 ft. away. Then fasten the horses to a looped chain fixed over the beam at about 5 ft. from each end, and with two men with a rein and a plough each everything is ready for a start. The ploughs fixed as described will throw a furrow away from the stems of the trees, and when this has been done throughout the whole block there is an open furrow left along each row, leaving the stems of the trees bare. The ploughs should now be changed so as to throw the other way, and the next round throws the soil back on to the trees again. Slip the loops of the chains about 9 inches towards the centre of the beam, and throw on another furrow, and repeat this till you are out of the way of the branches, when the ordinary teams may be put on to finish the work. The scarifiers can be worked in the same way as the ploughs, and with the soil in such excellent condition as it is this season- no weeds- not only is practically all the hand labour done away with, but the work of the second ploughing can be done by the scarifiers.

I have tried this system at Coonawarra this season, and it works admirably. The horses are kept from injuring the trees, and with a little alteration the handles of the ploughs will go under the branches of the trees, and, as one of the ploughmen remarked, "you can scrape the bark off the trees."

By allowing the horses to pull from a point on each side of the centre of the beam, all swinging of the beam is avoided.

DATES OF MEETINGS OF BRANCH AGRICULTURAL BUREAUX.

With a view of publishing in the "Journal" the dates of meetings of the Agricultural Bureaux, Hon. Secretaries are requested to forward dates of their next meeting in time for publication.

Branch	Date of Meeting.	Branch.	Date of Meeting
Amyton	Oct. 16	Morphett Vale	Oct. 7, Nov. 4
Arthurton	16	Mount Compass	11
Balaklava	6, Nov. 8	Nantawarra	15, Nov. 12
Burra	10	Narridy	25
Caltowie	13	Norton's Summit	17, Nov. 14
Cherry Gardens	14 Nov. 11	Orroroo	17
Clare	17 14	Port Broughton	13
Crystal Brook	18	Port Elliot	18, Nov. 15
Eudunda	13	Port Lincoln	17
Finniss	6, Nov. 3	Port Pirie	18 22
Forest Range	16, 13	Pyap	15 12
Gawler River	17	Rhine Villa	11 15
Hahndorf	18	Richman's Creek	— 17
Hartley	17	Riverton	11 15
Inkerman	14	Saddleworth	17
Kanmantoo	17	Stansbury	4, Nov. 1
Kingston	4, Nov. 1	Stockport	13
Koolunga	16, 13	Strathalbyn	20
Lyndoch	16	Swan Reach	18
Maitland	4, Nov. 1	Tatiara	11
Mannum	17	Willunga	4 Nov. 1
Meadows	13, Nov. 17	Wilmington	15 12
Morgan	11	Yankalilla	3

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report on October 1:—

Climatic conditions proved very favourable for September, although no real soaking rains fell, excepting in a few favoured districts in the hills. The weather, however, during the early half of the month being cool as well as moist, brought along crops and pastures nicely in the southern, central, and lower north, but, as we stated last month, nothing could save the dry agricultural areas this season, though the light rains will give a bit of feed in some favoured spots there. In the other parts named, however, prospects now lead to the expectation of fair crops being reaped if no serious mishap should occur this side of harvest time. Northern pastoralists are still crying out for rain, and unless it comes before the hot weather really sets in must give us trouble.

The improved outlook in the older settled agricultural districts through the timely rains is causing a better feeling among country traders, which is reflected in the city to a slight extent, though the failure of the season over extensive areas in the north must adversely affect the year's financial results with all classes. Things continue flat in mining circles.

It is thought by some that the breadstuffs market in Europe is not likely to affect Australian wheatgrowers during the next season, as stocks here are about eaten out, and the prospects are not very bright for our having any surplus for shipment from the coming harvest even in the exporting States of South Australia and Victoria. Still it is interesting to know English buyers are already regretting that dry Australian wheat is not likely to be coming forward to mix with their sample, which this season is unusually moist. The bountiful crops in America, especially Canada, will probably keep values down, so that shipments, if any, from the Commonwealth are likely to be very light. During the month Sydney has continued to draw upon Victoria and this State for wheat, so that values in Melbourne advanced to 4/9, whilst some 15,000 bags were sent from here at 4/8½ f.o.b. A dullness, however, has since set in, and the market at moment is lifeless, owing to a check in export demand, and local millers not being anxious buyers. The September rains caused Sydney orders for forage to slacken, but demand from W.A. for bran has reawakened interest in this line. Considerable shipments of chaff are being made to Sydney, but mostly in fulfilment of previous orders booked. The rains in N.S.W. led to a drop in hay of 30/ ton here, but as dry weather has supervened we will probably have that State again in our market as a buyer. Feeding grains are dull, with quotations nominal.

The potato market fluctuated somewhat during the month, but no extreme movements were displayed, though values are a shade higher than was realised when last we wrote. The dry winter weather is telling against prospects of the local crop coming on, though the position somewhat improved during the month. The season is not finishing up favourably for holders of onions, price having fallen away about £2 a ton since we last reported; new crop has not started to come in, but reports as to prospects are said to be favourable for those growing on the plains.

A very active business has been done in dairy lines, and higher values have averaged than expected. The seasonable increase in supplies of butter is later than usual, and fears are held that the flush time will be very short. There is a little surplus over our immediate local wants, which readily finds a good market in the Barrier and Western Australian trade, and it is to be regretted the quantity is not larger, as demand is good. The down trend in price that showed at the beginning of September was quickly checked by a renewed demand upon Victorian supplies from Queensland and N.S.W. This affected values here, hence better average than was looked for. Price, however, has eased down during past few days, and may for a week or two drop further, but low rates for butter need not be feared to last long this season. The 6d. per dozen duty on eggs in the federal tariff by restricting importations to the eastern States from China and adjacent countries has forced demand this way, so that values are ruling quite 2d. per dozen higher here than otherwise would, although the production has increased. A slight local easing in the cost of the live material caused bacon curers to lower their quotations slightly, but improved Interstate demand is likely to clear out any surplus bacon or hams that may be available on this market at present quotations. Fair business done in honey and beeswax; price unaltered. Cheese has continued in good demand at steady values. Almonds scarce.

Excellent values have been obtained for carcase meat and dressed poultry, but as hot weather conditions are now showing this trade may be looked upon as about over for the season. In live poultry good prices continue to be realised for all fit table stuff, and the market for birds to fatten has been very satisfactory.

MARKET QOTATIONS OF THE DAY.

Wheat.—Port Adelaide shipping parcels, 4/7½ f.o.b.; farmers' lots, 4/5; on trucks, per bushel 60 lb.

Flour.—City brands, £9 10/; country, £8 15/ to £9 per ton 2,000 lb.

Bran and Pollard, 1/5 to 1/6 per bushel of 20 lb.

Oats.—Local Algerian and Dun, 3/6 to 3/9; prime stout feeding, white, N.Z., 4/4 per bushel 40 lb.

Barley.—Malting, 4/9 to 5/6; Cape, nominal at 3/9 per bushel 50 ℔.

Chaff.—£5 15/ to £6 2/6 per ton of 2,240 ℔., bags in, dumped, f.o.b. Port Adelaide.

Potatoes.—Tasmanian, £7 5/; Mount Gambiers, £6 to £6 5/ per 2,240 ℔.

Onions.—Local Spanish, £5 10/ to £6; Mount Gambier, £5 15/ per 2.240 ℔.

Butter.—Creamery and factory prints, 11½d. to 1/½; private separator and best dairy, 10½d. to 11½d.; well graded store, 10d. per ℔.

Cheese.—S.A. Factory. 9d. to 9½; New Zealand, to 10d. per ℔.

Bacon.—Factory cured sides, 9d. to 10d.; farm lots, 7d. to 8d. per ℔.

Hams.—S.A. Factory, 10d. to 11d. per ℔.

Eggs.—Loose. 8½d.; in casks. f.o.b., 9¾d. per doz.

Lard.—In bladders, 9d.; tins, 8½d. per ℔.

Honey.—2¾d. for best extracted, in 60 ℔. tins; Bees-wax, 1/1 ℔.

Almonds.—Soft shells,, 5½d. to 6d.; kernels, 11d per ℔.

Above quotations, unless when otherwise specified, are duty paid values on imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of September, 1902:—

Adelaide	1·64	Manoora	1·32	Macclesfield	2 82
Hawker	0 94	Hoyleton	1·13	Meadows	4·17
Cradock	0 55	Balaklava	1·23	Strathalbyn	2·25
Wilson	0·64	Port Wakefield	1·06	Callington	1.53
Gordon	0·43	Saddleworth	1·26	Langhorne's Bridge	1·51
Quorn	0·77	Marrabel	1·33	Milang	1·44
Port Augusta	0·31	Riverton	1·45	Wallaroo	0·73
Port Germein	0·92	Tarlee	1·46	Kadina	0·68
Port Pirie	0·64	Stockport	1·42	Moonta	0·72
Crystal Brook	1·17	Hamley Bridge	1·22	Green's Plains	0·65
Port Broughton	0·75	Kapunda	1·75	Maitland	1·52
Bute	0·66	Freeling	1·16	Ardrossan	0·79
Hammond	0·34	Stockwell	1·10	Port Victoria	0·82
Bruce	0·32	Nuriootpa	1·15	Curramulka	2·42
Wilmington	1·53	Angaston	1·35	Minlaton	1·31
Melrose	2 06	Tanunda	1·48	Stansbury	1·76
Booleroo Centre	1·10	Lyndoch	1·37	Warooka	0·92
Wirrabara	1·59	Mallala	1·53	Yorketown	0·75
Appila	0·73	Roseworthy	1·07	Edithburgh	1·01
Laura	1·29	Gawler	1·39	Fowler's Bay	0·69
Caltowie	1·17	Smithfield	0·80	Streaky Bay	1·65
Jamestown	1·12	Two Wells	0·93	Port Elliston	1·57
Gladstone	1·19	Virginia	0·92	Port Lincoln	1·62
Georgetown	1·37	Salisbury	1·16	Cowell	0·52
Narridy	0·94	Tea Tree Gully	2·23	Queenscliffe	1·09
Redhill	0·76	Magill	2·01	Port Elliot	1·46
Koolunga	0·91	Mitcham	2·40	Goolwa	1·59
Carrieton	0·33	Crafers	4·06	Meningie	2·96
Eurelia	0·43	Clarendon	5·34	Kingston	1·91
Johnsburg	0·23	Morphett Vale	2·79	Robe	1·35
Orroroo	0·38	Noarlunga	2·43	Beachport	1·61
Black Rock	0·30	Willunga	3·00	Coonalpyn	1·58
Petersburg	0·72	Aldinga	2·59	Bordertown	0·85
Yongala	0·70	Normanville	1·89	Wolseley	0·65
Terowie	0·53	Yankalilla	2·16	Frances	1·33
Yarcowie	1·09	Eudunda	0·87	Naracoorte	1·55
Hallett	1 20	Truro	0·13	Lucindale	1·62
Mt. Bryan	1·45	Mount Pleasant	0·69	Penola	1·51
Burra	1·71	Blumberg	2·20	Millicent	2·31
Snowtown	0·71	Gumeracha	2·55	Mount Gambier	1·93
Brinkworth	0·79	Lobethal	2·57	Wellington	1·61
Blyth	1·24	Woodside	2·49	Murray Bridge	1·05
Clare	1·89	Hahndorf	2·83	Mannum	0·63
Mintaro Central	1·87	Nairne	2·12	Morgan	0·31
Watervale	2·04	Mount Barker	3·24	Overland Corner	0·48
Auburn	1·82	Echunga	3·30	Renmark	0·65

AGRICULTURAL BUREAU CONGRESS.

The Fourteenth Annual Congress of the Agricultural Bureau of South Australia was held in the Federal Hall, Adelaide, on September 9, 10, 11, and 12.

The Chairman of the Council of Agriculture (Mr.R. Caldwell) presided, and the following members of the Agricultural Bureau attended one or more sessions:—Amyton, Messrs. Jas. Gray, S. Thomas, and W. Hawke; Angaston, Mr. E. S. Matthews; Appila Yarrowie, Messrs J. H. Bottrall, C. G. F. Bauer, P. Lawson, and J. Wilsdon; Arden Vale, Messrs. F. Schuttlofel and A. W. Fricker; Ardrossan, Messrs. C. Dinham and G. J. Freeman; Arthurton, Messrs. W. H. Hawke, W. Short, and C. L. Palm; Balaklava, Messrs. A. Manley and W. Smith; Baroota Whim, Messrs. A. Raneberg and F. H. Flugge; Booleroo Centre, Dr. Steven; Bowhill, Messrs. S. Johnson and J. McGlashan; Brinkworth, Messrs. A. L. McEwin and J. Stott; Burra, Messrs. A. McDonald, W. Heinrich, and F. A. S. Field; Bute, Messrs. W. H. Sharman, E. Ebsary, and W. Hamdorf; Caltowie, Messrs. N. Hewitt and F. Lehmann; Carrieton, Messrs. M. Manning, J. W. Cogan, O. Hall, W. J. Gleeson, and J. W. Bock; Cherry Gardens, Mr. C. Ricks; Clare, Messrs. W. Kelly and W. S. Birks; Colton, Mr. M. S.W. Kenny; Cradock, Messrs. P. Gillick and A. N. Graham; Crystal Brook, Messrs. J. C. Symons and R. Pavy; Davenport, Messrs. F. B. Rathbone, T. McDowell, and W. Hodshon; Dawson, Messrs. O. Muller and J. Nottle; Dowlingville, Messrs. T. Illman and F. Lock; Eudunda, Messrs. J. von Bertouch and W. H. Marshall; Finniss, Mr. A. E. Henley; Forster, Messrs. D. E. Schencher, John Johns, and F. Towill; Gawler River, Messrs. H. Roediger and J. Badman; Gladstone, Messrs. G. M. Growden, C. Goode, and C. Gallasch; Golden Grove, Mr. R. C. Smith; Gumeracha, Messrs. A. Moore, W. A. Lee, and W. Cornish; Hartley, Messrs. B. Wundersitz and A. Stein; Hawker, Messrs. H. M. Borgas and A. C. Hirsch; Holder, Messrs. J. C. Rowe and E. Jaeschke; Inkerman, Messrs. J. Sampson, C. E. Daniel, and F. C. Smart; Johnsburg, Messrs. T. Potter and W. McRitchie; Kanmantoo, Messrs. P. Lewis, J. Downing, and E. Downing; Kapunda, Messrs. J. O'Dea, G. Harris, and J. A. Schultz; Koolunga, Messrs. T. B. Butcher, J. Sandow, and J. Butterfield; Lucindale, Messrs A. Matheson, W. Dow, and S. Tavender; Lyndoch, Mr. H. Kennedy; Maitland, Mr. W. Bowey; Mallala, Messrs. W. R. Stephenson and F. M. Worden; Meningie, Messrs. T. W. R. Hiscock and H. B. Hacket; Millicent, Messrs. S. J. Stuckey, R. Campbell, and A. McRostie; Minlaton, Messrs. T. Brown, J. McKenzie, and R. Newbold; Morgan, Messrs. H. Hahn and J. Bruhn: Morphett Vale, Mr. A. Pocock; Mount Bryan East, Messrs. J. Wilks and T. Wilks; Mount Gambier, Messrs. J. C. Ruwoldt and J. Dyke; Mount Remarkable, Messrs. J. McIntosh, C. E. Jorgensen, and W. Lange; Mundoora, Messrs. R. Harris, W. J. Shearer, and D. Smith; Murray Bridge, Messrs. R. Edwards and W. Lehmann; Nantawarra, Messrs. J. W. Dall and S. Sleep; Narracoorte, Messrs. G. Wardle and J. Wynes; Narridy, Messrs. B. Flavel and J. C. Myatt; Onetree Hill, Mr. H. H. Blackham; Orroroo, Messrs. J. Scriven, W. Robertson, and Jas. Jamieson; Paskeville, Messrs. J. P. Pontifex, T. H. Price, and W. S. O'Grady; Penola, Dr. F. Ockley and Mr. D. McKay; Petersburg, Messrs. S. Bottrill, M. Alford, and W. Miller; Pine Forest, Messrs. G. Inkster and R. Barr; Port Broughton, Messrs. W. Tonkin and W. R. Whittaker; Port Elliot, Messrs W. E. Hargreaves and J. Brown; Port Germein, Messrs. H. Kingcome, Geo. Stone, and G. F. Steinthal; Port Pirie, Messrs. Thos. Johns, E. J. Hector, G. M. Wright, and H. B. Welch; Pyap, Mr. G. Napier; Quorn, Mr. R. Thompson; Redhill, Mr. A. E. Ladyman; Renmark, Mr. F. Turner; Richman's Creek, Messrs. J. McColl, J. M. Kelly, and W. Freebairn; Riverton, Messrs. A. J. Davis, W. Hannaford, D. Kirk, and H. A. Davis; Reeve's Plains, Messrs. J. Arnold, and W. Day; Saddleworth, Messrs. F. Coleman and J. H. Frost; Stansbury, Mr. Alex. Anderson; Stockport, Messrs. D. G. Stribling, J. Murray, and C. Bransom; Strathalbyn, Messrs. M. Rankine, J. Cheriton, and W. M. Rankine; Swan Reach, Mr. J. L. Baker; Tatiara, Messrs. W. E. Fisher, Thos. Stanton, J. Rankine, and W. H. Killmier; Wandearah, Messrs. Geo. Robertson and C. E. Birks; Watervale, Messrs O. H. Castine, E. Treloar, and E. W. Castine; Willunga, Messrs. W. J. Binney and H. Richards; Wilmington, Mr. A. Maslin; Wilson, Messrs. W. H. Neal and A. Smith; Woodside, Messrs. R. Caldwell and A. S. Hughes; Woolundunga, Messrs N. Rogers and H.

Aldenhoven; Yankalilla, Messrs. R. Lovelock, G. H. MacMillan, J. Crawford, J. Cornish, and W. E. Heggarton; Yorketown, Mr. A. Jung.

Messrs. R. Caldwell (Chairman), J. Miller, J. W. Sandford, Col. Rowell, C.B., R. Marshall, T. E. Yelland, G. R. Laffer (members of the Council of Agriculture), F. Krichauff, and A. Molineux, (late Chairman and General Secretary respectively of the Agricultural Bureau), Prof. J. D. Towar, and a number of other visitors also attended.

Tuesday Evening, September 9.

Opening Address.

The Chairman—I will not at this stage make an address, but will merely call upon the Minister of Agriculture to deliver the opening speech.

The Hon. R. Butler—As Minister of Agriculture, and one who has had considerable experience in agricultural matters personally, it affords me great pleasure to open your fourteenth annual congress. It is the fourth time that I have had the privilege, as Minister of Agriculture, of making a few remarks at your annual meeting. I have various duties to perform in connection with the positions I hold as Minister of Agriculture, Minister of Lands, and Treasurer—more or less onerous, more or less pleasant—but there are none which give me greater pleasure than those connected with the Department of Agriculture. I recognise that if South Australia is to push ahead at all it must be by the development of our rural industries. We are essentially a producing State, but there are some parts which are capable of producing much larger quantities than they are doing at the present time. The future prosperity of this country depends to a large extent on its natural productions, which we raise from the soil. Anything which will tend to the development of these natural productions will of course meet with the approval, not only of the agriculturists themselves, but of the general public of this State, who will share the benefit of such development. I am hopeful we shall see within our rainfall line within the next few years at least double the production of the last ten years. I am satisfied that if South Australia is to carry anything like a large population it will not be accomplished by pushing our people out into the dry country, where they cannot make a living, but by bringing them and placing them on country where there is a rainfall sufficient to allow any one who works the soil a reasonable prospect in an average season of making an honest living. I can sympathise with settlers in the dry country. Every member of this congress recognises that the conditions at present existing are, to say the least, serious. I am sure there is not one person in this room who expected that we should have a drought so prolonged and intense as that we have passed through within the last few years. I have no doubt that there are some gentlemen here who have been living in the midst of that drought. I say the people in our northern country deserve the consideration—nay, more—the admiration of every member of this community. (Cheers) There is an old proverb which says—"Sweet are the uses of adversity." If the bad seasons we have been passing through will teach us some lessons which will be useful to us in the future we can then say that they have not been unproductive of good. If they will teach us to husband our resources, to pay more attention to details, to recognise that a smaller area well cultivated will in the long run pay better than a larger area roughed in, we shall derive some advantage from the drought. I have the privilege of being Minister of Mines. While I recognise that the mineral industry in South Australia has before now assisted in dragging the State out of the mire, still I attach far more importance to the development of agriculture than I do to the discovery of minerals, because a mine of course gets poorer as you take out the ore. Under our improved methods of agriculture, however, an increase in the volume of our productions will not tend to make us poorer but richer, because we now put into the soil a little more than we take out. We farmers are beginning to learn that it is essential to the best interests of this country that we should pay the very greatest attention to the most improved methods of farming, and to the principle of putting our country to the best use possible. I hope that we shall see on many of our large estates within the next 10 or 20 years a flourishing agricultural population. That will mean of course that it will be accomplished by a system of repurchase. I contend that the State will get back in connection with our railways and by other sources of revenue infinitely more than will compensate us for any risk we may incur in the repurchase of those estates. I may venture to say that it is owing to the alteration in our methods of farming. and the large amount of money which is spent at the present time in improved machinery and in commercial manures, that the agriculturists in our older districts are in a better financial condition than they have been during my recollection, at any rate. You will admit that as far as our settlement within our rainfall line is concerned there is more general prosperity among the agriculturists to-day, in spite of the dry seasons, than there has been for many years. The comparative success which the State has realised up to the present time within the rainfall area, and the fact that our finances are not in a more serious condition than they are, is to a large extent owing to the increase in our production owing to the improved methods of farming. I suppose I ought to make some sort of apology—at least I will leave it to you afterwards to decide whether some sort of apology is necessary or not. As Minister of Agriculture I have made certain alterations in connection with the Agricultural Department. I need hardly assure you that I have not made these alterations with the view of economy solely—in fact, I regarded efficiency and the putting to the very best use the material we possessed in connection with our agricultural departments, as infinitely more important than any question of a saving in the expenditure. Whatever saving has been, or will be. made in connection with the alterations that have been carried out, I shall be only too glad when better times come to devote to further assistance to the country agricultural bureaus the money to be expended in further experiments in connection with practical agriculture. As your Chairman to-night you have one of our oldest colonists, Mr. Robert Caldwell, who has been before the public for a great many years. He was not my choice as the Chairman of the Council of Agriculture, although I heartily endorsed it. He was chosen by the Council itself by a unanimous vote. (Cheers.) Last year our old friend Mr. F. E. H. W. Krichauff was Chairman, and I am sure you will all admit that there is no gentleman in the community who has taken a deeper interest in agricultural matters, or who has done more to assist in the development of our agricultural production, than Mr. Krichauff (Cheers.) In addition to that, in the place of Mr. A. Molineux, as Secretary of the Central Agricultural Bureau, you have now Professor Perkins, the viticulturist—a man who has taken his diplomas in agriculture, and who has had control of the Agricultural College—not only as Secretary of the Agricultural Council but also of the Agricultural Department. Mr. Molineux some twelve months ago told me he was getting on in life, and that the probability was that within a short time it would be advisable on his part to relieve himself of a large portion of the duties which he had performed for so many years with such advantage, not merely to the producers but to South Australia as a whole. I would like to say here on behalf of the Government, and with my warmest approval personally, that if Mr. Krichauff and Mr. Molineux will accept the positions of life members of the Agricultural Council the Government will be only too delighted to confer it upon them. (Cheers.) They will be able then—as I am sure they will gladly do—to give their life long and valuable experience to the assistance of the Council. By this means they will be able with their valuable advice to do as much good work as they have been doing in the past. I know that there is a fear that these economies and these alterations will lead to a disorganisation of the Department. As The Advertiser, in a very excellent leader, put it this morning—"You want a connecting link between the country bureaus and the Department in Adelaide." I contend that you have just as strong a connecting link with the Agricultural Council as you had before with the Central Bureau, as Mr. Molineux, who has given me valuable assistance in the building up of the Department, will admit. It seems to me that the policy we have adopted of having one body as the advisory council to assist the Minister is better than the three boards we had in the past, having no connection with each other whatever, and doing good work no doubt in their way, but without the opportunity of meeting together and discussing not only the special branches of agriculture that they were formed to assist in, but also the question of the development of our agricultural production generally. You will see by the agenda paper that the Chairmen and Secretaries are invited to meet together and discuss the best and most effective means of making the Bureau of the very best service to the State. I do not look upon the Agricultural Council as a body formed to relieve the Minister of any responsibility that attaches to his office. You all know that the Council has been selected from the very best talent in the community, and selected in many instances by those directly interested in the different industries. For instance the President of the Royal Agricultural Society has each year a position on the board ex officio. Then the viticulturists have the right of nomination, so have the dairy people, and I am quite willing that the wheat growers—the agriculturists—should have the right to nominate one or two representatives if any means can be adopted through the branches for the successful carrying out of that idea. I want the Council to be thoroughly representative of the various industries, so that the representatives might meet together and discuss matters of special significance. Taking into consideration the manner in which the Council has been selected there is no reason why it should not do the work of the three boards which have been abolished. The best policy would be for the Council to form committees to deal specially with the various branches of industry. Those committees after having carefully considered certain matters of importance should bring their suggestions before the whole body. If that were done I see no reason why there should be any difficulty in keeping up a fully sustained interest between the country branches and the Agricultural Council in the same, perhaps a better, manner than obtained heretofore. In fact if there was any fault in connection with the Department previously, it was that there was not really a connecting link between them, not a sufficient interchange of opinions, and if you can bring about a closer union between the Agricultural Council and the bureaus scattered about throughout the country, I am quite sure that you will push forward the development of our industries to a far greater extent than we have been able to do in the past. I have a book issued by the United States Department of Agriculture—which affords some interesting reading. There is one paragraph here that bears very closely on the argument I have been using as regards cohesion and union between the various departments of work in the agricultural industry. The paragraph states:—"The development of the department during the last few years has been rapid and a study of the conditions existing therein leads me to believe that the time is at hand for a movement toward bringing together the related lines of work. It is fully recognised, however, that whatever is accomplished in this direction must come through the harmonious action of all concerned, and a full conviction that the opportunities for broader lines of work will be increased. In the past the tendency has been to segregate the work to such an extent as to make it difficult to bring about close co-operation along the broadest lines possible. There can scarcely be any doubt at this time that the best interests of the department would be subserved by aggregation rather than segregation, but all advances along this line must be made in such a way as to give the broadest opportunity for the development of each division without in any way interfering with its integrity or organisation. The future success of the department will depend in large measure on each man being made to feel a personal responsibility as to the details of his work, and at the same time that he must lend his full support to matters of general policy, which concern the division of which he is a member and the department as a whole. The broader plan, and one which it seems perfectly feasible to carry out, has for its objects the arrangement of the work in such a close co-operative way as to bring the strongest support from every division interested. Aside from the mere question of close co-operation and the possibility of undertaking many problems not feasible under the present plan existing in the department, the intimate relation of the various allied groups will bring the investigators into more sympathetic union. Such a union cannot help being advantageous to all concerned, and is recognised in the proper spirit, will go far towards advancing the best interests of the department. With a view of putting into practical operation a plan based on the principles outlined four divisions of the department closely allied by the nature of their work, have become affiliated, and have perfected arrangements for a close co-operation and union along the lines set forth." The opinions I have quoted very much express my views on the question, and in better language than I have at command. With reference to these changes I have read a letter—a very amusing letter—which was written by a gentleman 12,000 miles away. It is from the late Minister of Agriculture, Sir John Cockburn, who has commented upon the changes which have taken place in the Department. If the doctor had been in South Australia he would have learned the reasons which actuated the Government in making the alterations, and would not have made so many absurd statements. In opening Dr. Cockburn has stated:—"If some demon of destruction had been let loose in the Departments of Agriculture and Education greater havoc could hardly have resulted." Considering that the letter was written before the new arrangements were introduced the doctor is out of court in his first sentence. The letter proceeds:—"How is information to be disseminated among the branches in regard to new methods, manures, and seeds, if there is no organisation specially directed to this end?" The experiments which are now being carried out in different parts of the State, and the work which is being performed by the bureaus, sufficiently answers that point. "The most wanton and outrageous act," Sir John continued, "was to call upon an elective body—the Dairy Board—to resign." Under the new regime the dairying industry is represented on the Council by two delegates, and there is no reason to suppose that these gentlemen will neglect the interests of that important pursuit. Sir John states further that he foresaw when he left office that his successors might be apathetic, and might fail to appreciate the requirements of the industry. Oh, dear! The writer goes on to assert that its interests would be safer if an elective non-official guardian were constituted as in Victoria. This is rather amusing. Of course, I know Sir John's weaknesses as well as his strong points. His strong point was not in administration. One of the reasons why Dr. Cockburn had so many boards was that he was frightened to take the responsibility himself. He did not know when to say "No" or "Yes." Sir John was possessed of a charming personality, and he had the advantages of the highest culture, but he should have waited until the farmers throughout the country found fault, and then he might have attempted to slay the Government. Sir John, is a little too soon. "But I forget myself," said the writer in conclusion, "it is so difficult to think of South Australia as other than progressive, that it is a wrench to recollect that a spell of contraction is over the land." That is very poetical. We are hopeful that there are better prices ahead for our productions, and I can only say that whatever little ability I have, whatever time and strength, will be given most readily to assist the Agricultural Department by fostering the Central Board and the branch Bureaux throughout the State. Of course we are not a selfish body. In our work there is really no individual success since we all recognise that whatever success is obtained is for the national good. I am sanguine that before long we are going to have better times in this State. I want to touch on a few matters concerning the work of the Department. Mr. Rounsevell last year tabled a motion in Parliament in connection with the institution of experimental plots, and under the supervision and control of the various branch Bureaux. Mr. Summers, the inspector of fertilisers—and I am sure there is no more efficient and diligent officer in the service than he—has been arranging with the various branches throughout the State for the adoption of experimental plots. We have 83 plots with manures for cereals, 70 with wheat, and 54 grass manure plots. The adoption of these experiments, particularly in respect to the manuring of grass lands, represents a very wise departure. I am sure that, like myself, those of you who have used these manures for your crops must have noticed the beneficial effect on the grass afterwards. Even within the short time of their use there is a very rapid increase in the carrying capacity of our land, and an increased fertility. At our Agricultural College farm the paddocks which they have been manuring for years with artificial fertilisers can carry four times the stock that they could when the land was first purchased. I am informed not only by Mr. Summers, who visited the place lately, but also by Mr. W. J. Blacker, one of the members for Alexandra, of a successful experiment in connection with manuring for grass near Aldinga. Every acre which had been treated with one cwt. of manure had four times as much grass as the land which was not manured. Experiments such as this are exceedingly valuable. I regret that this season being a very dry one, it is not at all likely that these manure tests will show to the greatest advantage. In many parts of the State we have less rain up to the end of August than in any previous season, yet if all the land sown with wheat had been manured our wheat yield would have been probably doubled. You can go through the country to-day and pick out readily the paddocks which have been manured, and those which have not. Illustrating the energy and enterprise shown in connection with this departure, I may tell you that this year, according to figures kept by the Inspector of Fertilisers, about 37,500 tons of artificial manures have been used which, calculating 80 lb. to the acre, would cover something like 1,000,000 acres of land. The area of fertilised land has been increasing by something like 200,000 acres a year. That means, I think, when you take into consideration the drills which have to be purchased and the cost of the manures, that the farmers in putting in their crops must have expended something like £200,000 this year apart from the cost of the seed. You can easily realise what an advantage that is to the trading community, while the revenue of our railways is greatly augmented. In many other directions our producers are pursuing an intelligent policy. You know that twelve months ago Professor Lowrie delivered his last address in this room, and it fell to the Government to choose a successor. From among the various applicants we selected at last one of our cousins from the United States, Professor Towar, who will address you to-morrow evening on his impressions of farming in South Australia. From what I have seen of that gentleman he combines caution with enterprise. He recognises in coming to a colony like this that in the first place he has to watch and learn before he can speak. He will be able to speak with authority when he has been here a few years. Even Professor Lowrie admitted to us last year that he felt he was on much stronger ground in discussing agricultural matters at the time when he was going away than when he first came. We can with confidence look forward to Professor Towar doing good work in connection with the producers, and also to continued success in connection with the Agricultural College at Roseworthy. There has been published in connection with that institution a balance-sheet. I should like you to read that carefully, and study it, because if there is any inducement to go in for improved methods of farming it is in the balance-sheet of that institution, where by means of fertilisers the returns show that they made a good profit after paying all working expenses. It has been almost unheard of in the past that an experimental farm—a farm carried on for experimental purposes—should make a profit on its operations. These experiments are sometimes successful and sometimes a failure, but they are just as valuable in guiding us as to what we should not do as to what we should do. These experiments should, therefore, be thoroughly advertised and made known throughout the agricultural part of our community. It is just as necessary for the farmers to know the results of experiments which proved failures as in the cases when they were successful. We are going to continue these experiments in connection with the Agricultural Bureau. Let me quote a few lines from the Year Book of the United States Department of Agriculture. It is in connection with the lines of work pursued in America. "The number and importance of the experiments which the stations are conducting in co-operation with practical farmers and horticulturists have greatly increased of late. Thousands of such experiments are now conducted in the United States. These range all the way from simple tests of varieties of plants to special experiments in the management of farm or horticultural crops, live stock; on particular operations such as tobacco growing. It is coming to be more clearly recognised that the field operations in agriculture or horticulture, conducted on the station farm need to be supplemented by similar work in a considerable number of localities in order to be of general usefulness to the State. In experiments with orchard fruits it is often better for the station to make arrangements to work orchards already established. Special investigations of different kinds must be carried on away from the station in order to be of any use. By going into different localities as the needs of its work demand, the station can make itself more useful to the State as a whole. Without doubt co-operative experiments need to be very carefully planned and thoroughly supervised to be successfully conducted, and their success depends upon their quality rather than on their number. It is encouraging to observe that more careful attention is being given to this important matter by station officers, and it is believed that this work may be made much more economical and useful than the permanent substations as ordinarily managed." I just quote that to show that we are working on the same lines as the most up-to-date agricultural country in the world—the United States—which I think ranks higher than France in the money which it spends in the development of agriculture. I have had a great deal of trouble in connection with that little insect—the codlin moth—and the opinions which exist as regards this question are very diverse. We have in one district deputations waiting on the Government, asking them to let things go. They are probably from the districts where the pest has gained a good hold. They say "Don't stop the sale of infested fruit; the more you scatter it about, the more you will kill it." Other districts in which the pest is not so prevalent say, "You must administer the law more firmly." In this way the Government are between two fires, and it is difficult to satisfy both parties. I am hopeful that the experiments which are going to be tried this year by Mr. Quinn will satisfy our apple growers as to whether arsenical spraying is going to be effectual. Even those who do not see eye to eye with Mr. Quinn give him the credit of being a most efficient officer. Two well-known growers, Messrs. Laffer and Sandow, who experimented last season with the arsenite of lime, say they had not more than 10 per cent. of codlin moth in the portion of the gardens where the trees were sprayed; while in other parts of the gardens where no such precautions were adopted they had comparatively little clean fruit. I am anxious that a conference should be held of orchardists from various parts of the State to see whether they cannot come to some agreement as to what it is best for the Government to do in the circumstances. I don't want to hamper in any way the people in earning their livings—on the contrary, I want to assist them. Since they have more rigidly enforced the regulations regarding the codlin moth question in Tasmania the prospects of the apple industry have greatly improved. There they do not allow the sale or even giving away of infested fruit; their export has increased, and they have supplied South Australia, as well as other centres, with apples. The pest in many cases is to a great extent propagated by the men who have only a few apple trees in their orchards, and who make their living chiefly on the cultivation of vegetables and other fruit. It is not of very great importance to them whether their apples are infested with codlin moth or not. Seeing that we cannot send this infested fruit to any of the other States or to the Cape, and that it is no use sending it to England if we want to retain that trade, the only thing we can do, if we are not going to make vigorous efforts to combat the pest, is to eat the codlin moth ourselves, and send all our good fruit away. I have received a letter to-day from Mr. Burney Young, of the London Depot, which contains information which is exceedingly valuable, not only to those who ship their fruit, but to those who sell it here. [The letter is published in another part of this issue.—Ed.] I would impress upon those present the necessity for a close study of the figures given by Mr. Young, which convey a fair idea of the most profitable varieties to grow for export. The prices do not average as much as they did last year, but there are reasons for that. You must understand that there was an abundant supply of other fruit in the London market at the time. Professor Perkins will be speaking on the viticultural industry, and he is very well up in the subject. He and others engaged in the industry tell me—and it cannot be doubted—that wine is going to be one of the most important and successful industries in the State. During the last two years our production has increased very largely. We have gone quite ahead of Victoria. For two years the production of wine totals over five million gallons. This is a long way the best record we have had in South Australia; on the other hand, the exports are increasing as well. The industry should be to us what it is to France, and there is no reason to doubt that it will. At present we have 22,000 acres of land under vine cultivation, but in the next 20 years we ought to show a very much larger increase. No State in the Commonwealth produces a better quality of wine than this State. Fortunately, we are free from phylloxera, and I hope we will remain free from that dreadful pest. I do not think that the money spent by the Government in assisting the wine industry has been at all wasted. It seems to me that before you take any department and say there has been a loss, you must take into consideration the benefit to the State as a whole. When the London Produce Depot was established the wine industry in South Australia was at a very low ebb. The feeling was universal that unless something were done to build up the trade and find a market a large number of vines would have to be rooted up. Instead of there being any real loss by what I call bonuses to the industry, there has been an encouraging development. As time goes on the importance of the trade and impetus given to it by that principle will be strikingly apparent. The export last year through the depot amounted to 163,595 gallons, and I am looking to the time when that quantity will be very much higher. So far as the general export trade is concerned I wish to tell you that Mr. Skevington, of the Port Adelaide Produce Depot, passed all the produce which the Government obtained for the War Office in London for the army in South Africa. Although the work was considerable not a penny was charged to the shippers for the inspection. We have shipped during the last two years, as the result of the efforts of our energetic Agent-General, Mr. Grainger, 142 tons of meat, value £7,538; jam, 776 tons, value £25,422; potatoes, 72 tons, value £655; hay, nearly 9,000 tons, value £67,422. Our lamb trade is at present under a cloud, but the reason is the absence of rain. I am hopeful of considerable development in this direction. Speaking from memory the lambs shipped through the depot last year netted the grower here about 7/9½, exclusive of fat and skin, for which, adding 2/, you get a total of about 9/9. Now, that is a very good paying price, and we know that last year the lambs were poor in quality. It has been argued that the building up of our lamb export trade has raised the prices of meat. This is simply ridiculous. Why meat in Sydney and Queensland is 10/ and £1 per 100 lb. dearer than here. The drought throughout the whole of the Continent has raised the price of meat, and the position in South Australia is that the cheapest meat in the market to-day is lamb. This industry with judicious management must go ahead. What would be the result if the producers of South Australia depended entirely on local consumption? The result with the lamb trade would be as in the past, that you will find the industry flourish for two or three years, but with the supply exceeding the demand there is stagnation. It is by building up an export trade, and by keeping up the quality of the produce that the industry is going to flourish. It will be my aim as Minister of Agriculture to assist in every possible way the doings of the Council, and the branch Bureaux, and any suggestions that may be made in connection with the development of our natural resources will receive my best and closest attention. I am anxious to assure you that any changes I have made in connection with the Department—whether they have been wise or not—have been made with the best of motives. I have endeavoured to secure efficiency and economy. In connection with the publication of The Agricultural Journal there will be a saving of about £450 a year—a saving that I hope to devote to the adoption of further experiments by the branch Bureaux. I hope to be able to deal more liberally with the Bureaux when the finances improve. You know that with the present condition of the country I have had to keep expenses down, and I am sure the agricultural community will support the Government in this matter. It has been our policy to judiciously economise, and although we have not been able to please everybody we have endeavoured to be fair. I wish the Agricultural Council and the Bureaux every success. (Cheers.)

Mr. W. J. Gleeson (Carrieton)—I move a hearty vote of thanks to the Minister for his able and interesting speech. Whatever he has done in connection with the reduction of expenses of the Department has been actuated by the best of motives. We have not yet become accustomed to the combination of offices, and, of course, until we do matters will seem strange, and the work perhaps difficult. I believe that what he has done is a step in the right direction.

Mr. J. Brown (Port Elliot)—I second the motion. I am sure the changes made will prove beneficial to all concerned. So far as I have been able to gather the work is proceeding as well now as before the change. We hope the results will be even better, and I am sure the Minister will help us.

The Minister of Agriculture—Hear, hear. I will give consideration to any questions sent to me by the members.

Mr. W. C. Grasby—I heartily support the motion. I believe the change will result in permanent benefits to the agricultural community. I have always felt that if the Bureaux did not reform themselves they would be reformed from the outside. I believe better work will be performed in the future, and that prosperity and advancement will result.

The motion was carried with acclamation.

Chairman's Address.

The Chairman opened with a brief tribute to the excellent work done by the late Central Agricultural Bureau. He deplored the adverse conditions that had of late fallen to the lot of the producer, dwelling principally on the shortcomings of the rainfall, and opining that the earth was at present sailing through some region in space unfavourable to the precipitation of moisture. The markets, too, on the whole, had been unfavourable. He deprecated the unhealthy boom which had prevailed in reference to some lines of our produce, arising from the unfortunate complications in South Africa. "These extraordinary demands," he said, "sometimes have the effect of stimulating a flagging industry, but not infrequently they call into existence industries that cannot be sustained, and result in arrangements that in the end prove disastrous." He then proceeded to quote figures illustrating the position prior to the war. He said that during the 20 years prior to 1891 we had exported per annum agricultural produce to the value of £14 4/6 per head of population; whilst during the six years immediately preceding the war this sum had receded to £7 5/2. He trusted that Professor Towar's influence on local agriculture would be such as to bring about a change for the better. He quoted Prof. Robertson as an authority indicating the necessity of extending the widest help to the producer. He deprecated the habit of giving in our dailies and weeklies more space to sports and amusements than to agricultural topics. He strongly advocated the industrial co-operation of producers, which was proving so beneficial in Canada. He commended the late Central Bureau for its initiation of agricultural experiments, and strongly urged their continuance. He suggested that our native grasses and plants had become weakened by long exposure to adverse climatic conditions, and that the introduction of exotic plants was necessary. He urged upon farmers the great advantages to accrue from consistent tree-planting. He referred at great length to experiments on agricultural matters that had led to much well-being in Denmark. He commented on the good work done in the past by the agricultural departments of the neighbouring States and of South Australia. He then pointed out to farmers that they followed a noble calling, to which even H.M. King Edward did not fear to claim membership. The King was an enthusiastic farmer and breeder of high-class stock. He then proceeded to detail some of the arrangements of Sandringham Estate. He called on all husbandmen to magnify their calling, and quoted in support some lines he had composed some thirty years ago whilst following the plough. He closed a long and interesting address by welcoming the delegates, and expressing the hope that their deliberations would result in general good.

Wednesday Morning, September 10.

Professor Perkins read the following paper on

HARVESTING WHEAT CROPS.

By S. Trengove, Bute.

Which is the best means of harvesting the crop? That the old method of stripping and cleaning will have to give place to the complete harvester is already granted by a large majority of farmers. The new machine does the work better and at a lower cost. Although the complete harvester is considered by most farmers to be the best machine for harvesting, I beg to disagree with them on this point. In my opinion, the binder and header system is the most profitable. We have tried this side by side with the stripper for four years, and with the complete harvester for two years, and the largest amount of profit has always been with the binder and header.

By using the binder the farmer can start harvest quite twelve days earlier on the average than he could with stripper or harvester. The risk of loss from the storms that often visit us in the earlier stages of harvest, and from fires that may travel through a large area of crop, is reduced very considerably. Not only so, but our experience is that we get wheat of a higher standard, the weight often being some pounds per bushel heavier than wheat left to ripen for the stripper. Again, there is the question of rust. Last season we had a crop badly affected by rust; so much so, that we had no hope of the grain reaching the standard of 62 lb. per bushel. We cut some of this with the binder, stacked it, and threshed it after the other crop was stripped. The wheat when cleaned weighed 68 lb. per bushel; whereas the wheat from the stripper weighed only 58 lb. per bushel, and the yield was 8 bushels per acre, instead of 16 bushels, which it would have produced if cut with the binder in time. The greatest advantage derived from the use of the binder is, however, the wonderful saving resulting from the use of the straw, which is valuable food for stock. It was recently pointed out in one of the agricultural journals that analyses had shown the straw from a wheat crop cut early and headed was very much better than ordinary straw from a stripped crop.

Many farmers object to use the binder because they think more wheat is shaken out, but practical experience has shown that there is less wheat left on the ground than after the stripper; while the system advocated will secure as much or more wheat per acre than any other method of harvesting. In seasons when there is no rust even ripe wheat cut with the binder, if of a tough variety, will not shake out. This is readily proved by examining after the winter rains the portions harvested with binder and stripper. On the land where the stripper was used there will be found much more wheat than where the crop was cut with the binder.

That the method of havesting advocated is more expensive than either of the other systems I readily admit, but not to the extent most farmers think. At any rate, the system I adopt is, I am quite satisfied, the most profitable in the end. One man can cut with the binder quite as large an area a day as he could strip, while a man can stook 12 to 15 tons of sheaves daily. The cost of cleaning after the header is a little higher, but carting to market is the same, except in rusty seasons. The extra expense is in the outlay for twine and the labour employed in stooking, carting in from the paddock, heading, and re-stacking the sheaves. We cart and stack the sheaves near the header, and then when we have finished the ordinary harvest we do the heading. By stacking before harvest the wheat ripens better than if left in the paddock, and the straw does not get so dry and brittle. Five men are required to work the header, &c., properly. They can, with 4 h.p. horseworks, and header to correspond, head and restack 2½ tons per hour. As compensation for this expense, the farmer has the straw, which, when chaffed, finds a ready sale at from 5/ to 10/ per ton less than good coloured hay chaff. If he does not sell it, he has a supply of food for his stock, which he will find much more profitable than cocky chaff.

The farmer who intends to head his wheat will find it important that he gets a binder with a perfect buttor, as if the heads are not fairly level there will be a considerable waste, or rather, a quantity of wheat will be left in the sheaves to enrich the feeding quality of the straw. It is important, too, that the ground should be free from stumps, or if that cannot be secured, all the higher ones should be out level with the surface, and the ground rolled to enable the binder to cut as low as possible.

We have headed three different kinds of wheat — namely, Steinwedel, Purple Straw, and Dart's Imperial. The first comes in very early, a desirable characteristic, but shakes too easily, and the straw is too brittle, and consequently is of less value than many other kinds. Purple Straw is a good wheat to head, but we prefer Dart's Imperial, as it is a tough wheat, and does not shake out and waste in handling. Its chief fault, however, is that it is difficult to get it in early enough to enable one to cut it much before the early wheats are fit for stripping. I would advocate for heading an early variety with a good straw, and one that does not shake out. Although I have not grown it myself, I think the Gluyas Early will be a good wheat to grow for heading.

The following are estimates of the cost of harvesting under the three different methods, taking as an example a crop 3 ft. high, averaging 16 bushels of wheat and one ton of straw. Any crop less than 3 ft. in height should not be cut for heading.

The Stripper.	s.	d.
Cost of stripping per acre	3	0
Cleaning four bags wheat	1	8
Cost per acre	4	8

The Complete Harvester.	s.	d.
Stripping	3	6
Sowing up bags	0	4
Cost per acre	3	10

Binder and Header.	s.	d.
Cutting and twine	4	6
Stooking	0	5
Carting and stacking	3	6
Heading and restacking	3	6
Cleaning	2	0
Cost per acre	13	11

Taking a 50-acre paddock, the figures work out:—

Stripper	£11 13 4
Complete harvester	9 11 8
Binder and header	34 15 0

It must be remembered, too, that proportionately a crop 3 ft. in height is the least profitable to bind and head. The cost of cutting and heading a 6 ft. crop is no more than one only 3 ft.

On last year's results the financial returns from the two crops previously referred to work out as follows:—

Headed.

16 bushels wheat at 2/6	£2 0 0	
1 ton straw at £2	2 0 0	
	£4 0 0	
Cost of heading, &c.	0 13 11	
Net return	£3 6 1	per acre.

Stripper.

8 bushels weighing 59 lb. per bushel at 2/3	£0 18 0
Cost of stripping	0 4 8
Net return	£0 13 4

I freely admit that it is only under special conditions, such as losses from rust, storm, or fire, that there will be such a marked return in favour of the system I am advocating, but my experience has been that under all conditions it is the most profitable way of harvesting the crop. If we put the value of the straw in the stack at 10/ per ton, from this alone we more than make up for the extra outlay.

Professor Perkins—I would like to point out that the value placed on straw is excessive. Very rarely one would realise £2 a ton for straw.

Mr. W. H. Neale (Wilson)—I think it is a mistake when it says there was a difference of 10 lb. a bushel between the headed and the stripped wheat.

Mr. Brown (Port Elliot)—I do not think there is any mistake. If the wheat was badly rusted I am surprised it went 58. The paper says it is better to cut the crop with the binder. On the Peninsula they knocked off cutting rusty crops with the binder because they were quite rotten. I profited by knowing that, for if I went to the expense of cutting the crop with the binder I would get nothing at all.

Mr. Molineux—For years I advocated the reaping of rusty crops with the binder, and it has been proved I was correct. If you reap it before it is dead ripe you stop the progress of the rust. You have altogether a better crop and heavier wheat than if you left it get dead ripe. Years ago I had samples sent to me of wheat reaped by both methods. Both were from the same crop, and the wheat that was stripped was considerably lighter than that reaped before it was dead ripe. Only last season I was appealed to by a member of the Mallala branch as to what I would do with a crop that was rusty, and I advised him to reap a portion of it before it was dead ripe. He did this and got good results, while that which was left did not give much. I am quite sure that binding the crop under these conditions will not cause any rotting of the sheaves. I think mistakes have been made in the paper as to the weight of the wheat and the value of the straw.

Mr. G. Stone (Port Germein)—The paper is a very interesting one. It is nine or ten years since I started with the binder and steam thresher, and the first year I used the binder I made a most exhaustive test of the two systems. I cut some and threshed it with the steam thresher, and I reaped some, and I headed some. From what I mowed and threshed I got nearly three bushels per acre more than from what I reaped, and it went a couple of pounds more to the bushel. The grain was altogether better. If we are to hold our own in the markets of the world as producers of wheat we must use the best and the cheapest machinery. The harvester is now coming into notice, and I believe this is going to cheapen the cost very much. We have had some bad experiences lately with regard to the drought and our fodder throughout the State is pretty well exhausted. It would be a good thing, when we have the opportunity, to cut a pretty large portion of our crops, and to thresh them or head them, and stack the straw. I would advise every farmer to take this matter seriously into consideration. With regard to rust I may say that about eight years ago I cut a very rusty crop with the binder. I stacked it for hay, but, to my surprise, when I came to chaff it there was some splendid grain in it. It goes to prove that even in this dry climate the straw is feeding the grain after it is cut, even if it is rusty. I would advise farmers to try these different methods of harvesting.

Mr. E. Ebsary (Bute)—I can endorse what the writer has said as to the binder and stripper. Last year I had a very heavy crop badly affected with rust. What was cut with the binder and stacked produced top price in the market. What was left and was reaped with the stripper was not marketable. The grain was no larger than canary seed.

Mr. T. Illman (Dowlingville)—If the sheaves have been found to be rotten and have gone worse afterwards it is proof that they have been cut too early. I find stock are fond of straw cut when the grain is just about in the dough. The grain is plumper and heavier if it is taken in the proper stage.

Mr. W. R. Whittaker (Port Broughton)—I am quite satisfied the writer of the paper is near the mark. Still you require a stripper to take off most of your crop, as you can't get the wheat to the market so quickly when you use the binder. At the same time I cut with the binder when I can. The farmer should make a practice of cutting some of his crop with a binder. Most of us must admit that to cut wheat in the dough state is a good thing, and in the years of plenty I would advise anybody to cut a portion of their crop and head it. Nearly every six or seven years we have these shortages, and it would be advisable for farmers to keep a stock of straw rather than have to buy from other people as we have had to do this year.

Mr. Bowey (Maitland)—As to cutting rusty crops with the binder as a means of securing a harvest, I think we must accept that with some amount of caution. I think also the writer has overestimated the value of the straw, although to the farmer himself in a season like this it is almost impossible to put a value on it. It is wise to provide for these emergencies, and a stack that is cut under the conditions named—by the binder and headed—provides feed of a high class. In addition to the methods of farming which we are all adopting we ought to adopt a system in connection with our grazing. I believe our farms could be put to greater use if we utilised the straw available in this direction. We could increase our dairy stock and sheep if we had this means of feeding them in the winter. We would enrich our soil, and they would repay all they got out of it.

Mr. Birks (Wandearah)—I think 90 per cent. of the farmers will admit the practice of harvesting a portion of the crop at least in the way suggested by the writer is a very good one. I would like to mention a fourth way of handling the crop. As a small farmer I have been adopting this plan, whereby we save a large amount of labour and get all the advantages that can be claimed by the header. It is simply a rearrangement of the ordinary machines on the farm—the fixing of the chaffcutter above the winnower, and having an elevator to take straw away from the winnower. Most of the wheat is just as good as if put through the header; the portion that is not taken out or damaged is left in the chaff, so that in feeding to stock it is not necessary to mix grain with the chaff, as it has been in the case of heading and cleaning. The straw is cut and handled when in a better state than if it had been through the header, and the whole thing is done in one operation, instead of two or three. Some have argued that we cut the grain and that it spoils the grain. I found by practical experience that that is not the case. Perhaps in the first five minutes there is a little grain cut, but it is very little, and if you take a sample out of several bags you will find that it compares very well with any wheat that comes through the header. For a man feeding wheat and chaff to stock it is the best and cheapest plan of handling the crop. A portion of the crop must be cut with the binder, and it must be done in the cheapest possible way. By this means the ordinary labour on the farm can work it, whereas with a header there is not the labour available unless it is employed from outside.

Mr. Brown (Port Elliot) said—I would like to see an experiment tried. A given area of crop should be cut with the binder and then put through the header, and a similar area stripped, and results compared with the header. I do not see how you are going to get the knots out of the wheat.

A Delegate—People I have come in contact with, and who clean the wheat, say they have considerably more difficulty with headed wheat than with stripped. The idea suggested in the paper has not been extensively adopted, but I would like those who have tried it to give us the benefit of their experience.

Mr. Jorgensen (Mount Remarkable)—The cleaning with the header is not more difficult; in fact it is easier. The wheat drops straight down, and the chaff blows away.

Mr. McColl (Richman's Creek)—I want to say a word in reference to the value of the straw. Two years ago I cut with the binder about 20 acres of wheat, as it was going off rather quickly owing to the hot winds, and the yield was not so good as from the crop harvested with the stripper, but the portion headed was suffering from the effects of the hot weather. Since the seasons have got so dry we were very glad indeed that we saved this stack of straw, and I am sure that nobody will lose by cutting a portion of their crop by the binder, and putting the straw away for future use, as the time will come when it will prove very useful. From the conditions of the stock I am sure that there is a good deal of nourishment in the straw when it is cut early. One point I would like to refer to is that the writer of the paper allows nothing for the ordinary stubble. It is a well-known fact that the header straw is more valuable.

Mr. Kennedy (Kadina)—I recognise the advantage of saving straw for years of plenty. In fact, I think we are all agreed on this point, and it seems to me to be of little use our discussing the value of straw. It is impossible to lay down hard and fast rules as to the way to harvest the crops. Every farmer must use his own judgment in this as in many other matters. We should all make a rule to conserve the straw wherever possible. In this connection, however, a farmer cannot be expected to have machinery which is only suitable for use in particular seasons. It would probably lie idle for many years, and you will have your sheds filled with expensive implements which are used only occasionally.

Mr. Miller—We have heard the experiences of those who have had to cut straw, but many of us in the north have had failures in our crops. I would like to see farmers adopt co-operative principles more largely; particularly in connection with steam threshers. I think the header is more costly. They have the steam system at Baroota, and the example is worth following. Every man ought to save the straw if he can. We lose a lot of wheat with the header, and it would pay the farmers to make more use of the steam thresher. Mr. Trengove refers to Gluyas wheat, but I don't think it is the best for hay.

Mr. Stuckey (Millicent)—Some years ago I read in a pamphlet a very interesting and instructive account of what the French had done in the direction of experimenting with straw. In France they placed, by way of an experiment, so many thousand horses on a ration of straw, and an equal number on a ration of hay, each group having the same quantity of grain in addition. The horses which were fed on straw performed the same amount of work as those fed on hay, but they did not carry quite so much condition. In our district large quantities of straw are sometimes used for fodder when we have not got hay. This year the whole of this straw has been cut into chaff; some of it having been in the stacks two or three years.

Mr. Stone (Port Germein)—Mr. Miller has left the impression that the steam thresher is not a success. (Mr. Miller—Oh, no.) Since we have had the thresher we have had bad seasons, and have had little stuff to cut. When the drought passes away I believe we will be able to employ the thresher extensively. The header is not a success. In some seasons you get three or four rains and three or four different growths of wheat. It is impossible for any header to get out all the grain. With the header, there must always be some waste.

Mr. R. Barr (Pine Forest)—The statements made by the writer of the paper are substantially correct. I have had ten years' experience, and my policy is to head the wheat, and not to thresh it. I advise you to cut a portion of the crop. You cannot, however, harvest large areas with the binder, but must use the stripper and the harvester as well. I have tried the suggested method of putting the sheaves through the chaffcutter, and I find it is a failure. No particular method can be called the best, as it depends almost entirely upon the season which will prove most profitable. We have been unable to do anything with the binder for several years owing to the drought.

Mr. C. E. Birks (Wandearah)—The previous speaker has said that the treatment with the chaffcutter does not work. If he is not satisfied I will bring him positive proof that the method is not a failure, but a great success and a considerable saving all round.

Mr. W. H. Hawke (Arthurton)—I have adopted a method which seems to work out fairly well. I have a 100-ton stack of straw in hand now. I cut it about four years ago. The plan I adopted was to have two strippers going and a binder following behind. I put salt with the straw as I stacked it, and it is in a first-rate condition now. About seven years ago, when the first bad season came, I lost a lot of sheep, and after that I was determined to adopt some plan. I have found this one successful.

Mr. Pavy (Crystal Brook)—I am quite in harmony with the last speaker. It is a plan that I have adopted for years past. You get a large quantity of straw in first-class condition, and with a little salt you put it away. It will stand you for many years, especially if you have it properly thatched. This method is economical. The estimate put down in the paper is very unfair I don't think Mr. Stone's statements will induce the farmers in his neighbourhood to go in extensively for the threshing machine. My method is cheaper and better in every respect. I advise the farmers to try a few acres, and see which method they like best. Rust-resisting wheats are not the best for hay.

Mr. R. Marshall—I think very many of the rust-resisting wheats make good hay, but in others you get inferior stuff. I am afraid the previous speaker's experience is not an extensive one otherwise he would not have made the statement he did. I have had some experience in heading. One year I sold between 400 and 500 tons of headed straw at £4 10/ per ton. In the past I have sometimes reaped as much as 600 and 700 acres. If you get the proper kinds of rust-resisting wheats they are equally as good for hay as other kinds.

Mr. Maslin (Wilmington)—I quite agree with the policy of conserving the straw. One matter, and a very important one, about which nothing has been said, is the scarcity of labour. If you have heavy crops in the north there will be a difficulty in getting the necessary labour to reap them.

Mr. McEwin (Brinkworth)—I think the previous speaker hit the keynote of the whole trouble when referring to the labour conditions. If you have a big crop you won't get the labour to deal with it. I do not believe there is a single farmer who does not make full use of his harvest. The whole thing revolves on labour conditions. Still, there is a great deal in the conserving of straw.

The Chairman—Has any gentleman in the room discarded the use of the stripper in favour of the binder and header?

Several delegates—No.

Mr. C. E. Daniel, of Inkerman, read the following paper:—

THE ROBBERS AND WASTERS ON THE FARM.

This subject is a very comprehensive one, embracing as it does nearly every branch of farm work. In no business or occupation are there usually so many wasters as on the farm. The farmer who is free from them must be a very shrewd man indeed, and a successful farmer, too. Even on the most up-to-date farms, however, you find some robbers, some wasters. In no other occupation or profession is there so much room for the expansion of the business capabilities of a man as in the management and working of a farm. A farmer must be something more than a mere grower of wheat; he must breed and keep stock of every description, and engage in various business transactions requiring shrewdness and ability. The observant man can, however, always find some wasters or robbers on every farm, and we will refer to a few of the most common.

First we find them in useless horses. On how many farms do we see 10 or 12 working horses kept where eight or nine properly fed would do the same amount of work. On the farm where I was born and brought up we used to keep 13 or 14 working horses. One year, being very short of feed, we sold six, and yet we managed to get through as much work with the remainder as we did before. On some farms we see four or five light horses where only one or two are really required. These horses are robbers and wasters of the farmer's substance. Take it that during the year each of these horses will eat 2 tons of hay, it means that the farmer is losing £5 per annum on every horse beyond what are really necessary to do the work properly.

In cattle we also find robbers and wasters—cows that only yield 5 lb. or 6 lb. of butter per week, and yet eat as much as cows producing 10 lb. of butter. With butter averaging 1/ per lb. this represents a weekly loss of 5/ or more on each interior animal. In sheep we find the same; ewes that are poor mothers, and some scarcely mothers at all. One ewe will rear a lamb worth 10/, while another will rear one that will fetch only 6/ or 7/. Again we sometimes see wethers kept on the farm all the year, bringing in nothing but a bit of wool, but eating the grass, and that in remarkably quick time. The farmer is wasting the feed and robbing his banking account on these wethers. With pigs, some sows are prolific breeders; others only rear a few young, and these are bad doers. The one class are profitable, the other the reverse. The farmer who keeps on breeding from the latter is robbing himself. Then we come to poultry. How many farmers keep fowls that are poor layers and too small to make good table birds. The keeping of poultry can and should be a profitable source of revenue, but we must get rid of the wasters and robbers. In fact, the same applies to all stock; even to the useless dogs so many of us keep.

As with stock, so with implements. If what we have are not the best for the work they are robbers and wasters. Take the oldfashioned plough with long mouldboard and blunt shares; they require more strength to do the work, and rob the horses of their flesh and waste the farmer's feed. All blunt tools for cultivating the soil are wasters of time, horsefeed, and horseflesh. In machinery we have the ordinary mower and horserake; for haymaking these are wasteful. The stripper is another waster, leaving on the ground very often sufficient grain to resow the paddock. It is quite time we had it altered to save the grain better, or got an effective substitute for it.

Then many farmers adopt methods and practices that are wasteful, or by their carelessness rob themselves. Allowing mallee shoots and bushes to grow along the division fences to take the moisture out of the ground for yards around is one of these. Another is missing strips 5 ft. or more in width along the fences when cropping. This means the loss of a swathe of the binder right round the paddock; in an 80-acre section averaging a ton to the acre this represents a loss of 1¼ tons, or £3 2/6, for the sake of a few hours' extra labour.

There are many other points that could be touched on, but sufficient has been said to indicate the necessity for keeping clear of the robbers and wasters on the farm if we wish to keep abreast of the times and make a little money out of farming.

Mr. G. Stone (Port Germein)—I agree with every line in the paper except as to cropping right up to the fence. I know a man who ploughs right up to his fence every year, but runs the scarifier round to keep all vegetation down in order to protect the fence from stray cattle.

Mr. Kennedy (Kadina)—I am opposed to certain things in the paper. We all know there is waste on the farm in many things, but I don't think there is a farmer here that will say that the mower and horserake are wasters. There are five seasons out of every nine that you are bound to use them. Three years ago you could not buy a mower or grass cutter in Adelaide. That proves that it is not a waster, and if the mower is not then the rake is not. Then there is the ordinary stripper. No one will say it is a waster. You cannot do without it, and, therefore, it is not a waster.

Mr. R. Thompson (Quorn)—I do not think any farmer can bring the mower in as a waster. On hundreds of farms there is no binder or header, and a man has to feed his stock with loose hay.

Mr. W. R. Whittaker (Port Broughton)—I think the paper is a very good one. It brings before us things we do waste. We all know the stripper wastes. If you bind your crop you waste. We waste all round. With poultry and cows there is waste. We can't help this waste, and it will go on continually. The thing is—Can we prevent some of this waste. It is well to bring such papers before us, because it may show us how we might save. I know we keep too many horses.

Mr. McEwin (Brinkworth)—We cannot lay down hard and fast rules. I was brought up in the south, and am now in the north, and the experience

I gained in the south was not of much use to me where I am now. I found I did not know as much as I thought I did. A man cannot discard his old implements to go in for new ones. The most successful farmer is the one who goes along carefully. There are some few who make hits as men do in buying shares, but they are very few. I would ask farmers if they do not think we are making a great mistake in feeding our horses on short feed. I fed mine for 10 or 11 years on nothing but short feed, and something was always going wrong with them. I kept about 18 or 20, and my loss came to about £50 a year. An old farmer said to me, "Take your sledgehammer and smash your chaffcutter." He said, "I have done that with mine." He had the best horses in the district, and got through as much work as any one. Instead of smashing it I lent my chaffcutter, and feed only on long hay. My horses to-day have not been out of the collar for the year, and there is not a horse in better condition in the district. I give them corn and cocky's chaff as well as hay, and they are in the very pink of condition. This team fallowed up 300 acres of ground, and they are now reworking it. The horses do not have a single day's spell. We are going in for too much short feed. Since I have taken to long hay my horses have not been troubled with colic, and I have not lost a single horse. As to the stripper, I have two, and I do not believe my loss is 5 lb. to the acre in grain.

Mr. Maslin (Wilmington) I think it is a penny wise and pound foolish policy to sow close up to the fence. I crop about 1,000 acres, and I leave 4 ft. to 5 ft. all round the paddock. It prolongs the life of the fence, as the cattle do not reach through and break it down, and is a protection against fire.

Mr. J. Miller (Council of Agriculture)—In reference to the remarks about dairy cows, I think the writer of the paper is right. Some of the most experienced men in Victoria tell us that the output of the dairying industry can be doubled without increasing the number of cows. The tick is a robber in connection with poultry. Great trouble is taken by many farmers in rearing poultry, and when the young chickens are nearly grown the tick takes them. It is a great danger to our poultry industry. Such a paper from so young a man is very creditable to him. I have noticed that the young men of this country will go a mile to get a horse in order to ride a mile and a half. I think fewer horses could be kept with great advantage. I don't agree with the writer in cultivating right up to the fence. We should have more trees for shade, and they would help the climate and act as breakwinds. Most of us recognise the value of shady trees, and you could not have a better place for them than along the fence.

Mr. Marshall (Council of Agriculture)—It is a great waste to cultivate too near the fences. Your neighbour's cattle are continually reaching through and breaking down the fence. I have had eight or nine posts broken off in this way. Then as to the stripper, taking the ordinary stripper in good condition I don't think it can be termed a waster, because many crops are too light, and it is impossible to gather them in any other way. I think it will always be the popular way of harvesting light crops. I think it is a waste to use the grasscutter and the rake. The more economical way would be the side delivery mower. If you cut a short crop with the ordinary grasscutter you lose one-half in raking, and the other half is very dusty. As to cows, you will find that one cow will give 10 lb. of butter a week, and another 5 lb. or 6 lb. under the same conditions. It is the same with sheep. One sheep will give 6 lb. of wool and another 16 lb.

Mr. Molineux—An important point is the employment of superfluous labour and the efficient management of the farm. There can be important robbers in that direction.

Mr. Jorgensen—What are the best sheep to keep?

Mr. Marshall—There is a great variance on that point, and the only way to get to any conclusion is to make a close study of any given locality.

Mr. Daniel (Inkerman)—One of the speakers referred to the destruction of fences by stray cattle. In our neighbourhood we don't allow stray cattle on the roads.

Wednesday Afternoon, September 10.

Professor Perkins read the following paper:—

PROSPECTS OF THE WINE INDUSTRY.

INTRODUCTION.

The trade barriers that but recently separated State from State have been definitely broken down, and new channels have been opened out to the surplus productions of the various States. There are many who would have us believe that our local industries are likely to be submerged by the inrush of foreign wares, and who see in the present undeniable stagnation an inevitable consequence of Federation. I prefer to think that we are in a state of transition, and that the commercial relations of the next few years will furnish no real indications of what the future has in store for us. The markets of the future will belong to the most enterprising, and not to the richest State. We have not been found lacking in enterprise in the past, nor are we likely to lag behind in the years before us. Times are undeniably dull, and dependent as we are on the returns of the soil they could not be otherwise after a disastrously protracted period of drought. The contemplation of the position of one of our national industries that must in the opinion of those best able to judge benefit considerably by the changes brought about by Federation, both in the immediate future and in the years beyond when trade relations will have found their normal level, may perhaps help to create a more healthy feeling than the prognostications of pessimists. It is largely with this object in view that I purpose laying before you what appear to me to be the prospects of the wine industry. "The wine industry has never been on a better footing" are the words used to me by one of our foremost makers; none others could better describe the situation.

JUSTIFICATION OF WINEGROWING AS A NATIONAL INDUSTRY.

It is well to understand that vinegrowing is in no wise antagonistic to any of the other rural industries. In point of view of acreage it must always be overshadowed by the great wheat and wool producing areas; and though it must slowly expand at their expense, the few acres it may take to itself will not be missed in the total production of the State. At the present moment vines occupy 20,860 acres of land, as against 2,025,803 acres devoted during the past season to cereals (wheat, barley, oats, and fallow). or slightly more than one hundreth of the area. The claims that vinegrowing have on us as a national industry appear otherwise important, if overlooking for the moment its present somewhat limited acreage, which recent events must call to considerable expansion. we consider it as a revenue earning occupation, and a source of employment to wage earners. A comparison of results may not be without interest. During the past season the yields from the area under cereals were perhaps below average. The improvement in prices, however, seems to compensate losses in this direction so far as general estimates are concerned. I estimate the money returns as follows:—

8,012,762 bushels of wheat at 3/6	£1,402,233
712,616 bushels of barley and oats at 2/6	89,077
346,467 tons of hay at 40/	692,934
	£2,184,244

This represents on an average a gross return of about £1 1/6¾ per acre.

The official returns enable us to represent the gross returns from the vine area as follows:—

2,431,563 gallons of wine at 1/3	151,972	14	0
367 tons of raisins at £37	13,579	0	0
171 tons of currants at £50	8,550	0	0
5,240 tons table grapes at £5 (approximation)	26,200	0	0
	£200,301	14	0

So that whilst vines occupy about one hundreth of the area allotted to cereals they return in gross revenue nearly one-tenth of the sum returned by the total cereal area. Reduced to returns per acre the figures are still more striking. From the 20,860 acres must be deducted about 2,327 acres of young vines not yet in bearing. This leaves 18,533 acres, among which must be divided £200,301 14/. This division gives as gross returns per acre £10 16/2. I would point out that these results are not calculated from a few favoured localities, but that they represent actually last year's returns, good and bad thrown together.

The State as a whole cannot but benefit in various ways from the high average returns obtained from land under vines. One of the principal advantages that may acre of vines absorbs from five to ten times more labour than an acre of cereals. And here I shall close my plea for vinegrowing as a real national industry, and pass on to what is more correctly my text to-day—the examination of its future prospects.

ADAPTABILITY TO LOCAL CONDITIONS.

We have not the leisure to enter upon a discussion of the adaptability of the vine to the conditions with which Nature has endowed our country; and were it otherwise, so thoroughly has South Australia proved itself in every way a congenial home to this plant, that I should probably restrict myself to the assertion that within our good agricultural areas no conditions of climate or soil are likely to impede its further progress. To-day we must take for granted what no person of experience would think of disputing. Economic conditions on the other hand, even to experts, are perhaps not equally self-evident; nor do they to an equal degree come within the range of general observation and knowledge; nor in a land not unacquainted with commercial upheavals and depressions can we afford to overlook them. It is therefore mainly with the economic aspect of the question that I purpose dealing to-day. I feel confident that it will reveal to us a condition of affairs no less encouraging than the contemplation of our undoubted privileges of climate and soil.

PROGRESS IN THE PAST.

The measure of extension of the vineyard area must stand as the ultimate index of the progress and prosperity of the industry; and if we accept £11 as the gross receipts from every new acre, however limited this progress may be, it will always represent a substantial addition to the wealth of the State as a whole. The figures below give an indication of what has been achieved in the past.

Table I.

Progress of Area and Yield of Vines from 1893 to 1902.

Year.	Area.	Wine.	Raisins.	Currants.
	Acres.	Gallons.	Tons.	Tons.
1893	15,418	1,105,221	36	—
1894	—	1,158,900	--	—
1895	—	1,578,590	—	—
1896	—	1,743,090	—	—
1897	18,333	1,898,105	355	—
1898	18,761	1,263,998	208	43
1899	19,159	1,342,960	310	57
1900	19,438	1,558,285	270	152
1901	20,158	2,813,301	408	131
1902	20,860	2,431,563	367	171

Table I. shows that progress has been steady, if slow, since 1893. This is as it should be. Mere lust of planted acres should not lead us to allow our production to outstrip the demands of the market. Wine is a commodity that cannot be forced on the public, particularly a public of British origin. The possession of vineyards has not even yet eradicated from our minds the old time prejudice that wine is the costly beverage of the rich, and can find no place on the poor man's table. Nevertheless it must be recognised that in South Australia at least our national obduracy has somewhat relaxed in this respect. We have yet to learn, however, that wine can be disposed of almost as cheaply as beer, without in any way injuring the interests of the makers.

FACTORS LIKELY TO INFLUENCE FUTURE PROGRESS

Future progress, or extension of our vineyard area must be governed by three independent factors:—

1. Increased demand from the home market.
2. New demands of the interstate trade.
3. Increase of the general export trade.

An examination of these different factors should indicate in what measure it may prove safe to further extend our existing vineyard area.

LOCAL CONSUMPTION OF WINE.

The figures concerning the local consumption of wine are perhaps not as reliable as might be wished. It has been suggested to me by Mr. W. Reynell that a fair approximation could readily be arrived at by taking into account the wine in stock at a given time, adding to it the results of several successive vintages, and subtracting wine exported or used for distilling purposes and vinegar making, and making due allowance for waste and evaporation; the figures obtained, minus the wine in stock at the time, would represent local consumption during the period of years under review. Unfortunately I have not had the time to collect the information necessary, and have in the present case to rely on Coghlan's computations given in the table below, noting, however, that they are looked upon by many as perhaps in excess of actual facts.

TABLE II.

Average Yearly Consumption of Spirits, Wine, and Beer in each State, and New Zealand, during years 1898, 1899, and 1900 (Coghlan).

State.	Spirits.		Wine.		Beer.		Equivalent in Proof Spirit per Inhabitant.
	Total.	Per Inhabitant.	Total.	Per Inhabitant	Total.	Per Inhabitant.	
	Galls.	Galls.	Galls.	Galls.	Galls.	Galls.	Galls.
New South Wales	951,548	0·73	858,477	0·66	12,446,932	9·58	2·17
Victoria	838,900	0·72	2,254,256	1·94	13,704,562	11·76	2·83
Queensland	444,772	0·98	249,622	0 55	5,278,665	11·58	2·64
South Australia ..	141,057	0 39	815,633	2·26	3,224,124	8·95	2·23
Western Australia ..	268,363	1·85	155,062	1·07	3,453,343	23·84	5·24
Tasmania	66,658	0·39	15,842	0·09	1,238,155	7·33	1·37
New Zealand	470,132	0·65	104,043	0·14	5,900,349	8 18	1·75
AUSTRALASIA	3,181,430	0·74	4,452,935	1 03	45,246,130	10·48	2 41

From the 815,633 gallons, which according to Coghlan represented our average yearly consumption of wine during the years 1898, 1899, and 1900, would have to be deducted foreign wines imported and consumed, for we may almost consider the amount of wine imported into South Australia as having reached an irreducible minimum and not likely therefore in the future to be displaced by colonial wines. From 1896 to 1900 South Australia's imports of foreign wines averaged 18.993 gallons per annum, which leaves us therefore, according to Coghlan, an annual consumption of local wines equal to 796.640 gallons. Against a consumption of 3¼ million gallons of beer this figure seems small enough; nevertheless as the accuracy of Coghlan's estimate has been disputed, let us admit that the average local consumption is not likely to exceed 800,000 gallons for some years to come; and let us base our calculations on these figures on the assumption that they represent, not the amount of wine actually consumed, but the volume that wine represented when official statistics are taken, and before losses consequent on evaporation and manipulation have occurred. Assuming that our average yield were about 160 gallons per acre, local consumption may be taken to account for the produce of 5,000 acres.

TABLE GRAPES.

There is no reason why the area under table grapes should contract. Local demands, on the other hand, are not likely to increase rapidly, so that I anticipate that the 1,700 acres at present devoted to this purpose are likely to supply all our requirements for some time to come. It is likely, however, that the interstate trade in fresh fruit will progress steadily in the near future. In order, therefore, to avoid future reference to this point I shall look upon 2,000 acres as devoted to table grapes at present, or in the near future.

RAISINS AND CURRANTS

With reference to currants and raisins, we need hardly discuss the question of the possibility of a gradually increasing local demand. Instead of being exporters, as we might well be, we are heavy importers of these goods. A glance at the figures below will show our present position.

TABLE III.

Imports of Currants and Raisins into South Australia.

Year.	Currants.	Valued at	Raisins.	Valued at
	Tons.	£	Tons.	£
1893	740	12,501	331	5,625
1897	614	10,404	292	10,335
1898	603	10,731	498	18,666
1899	811	12,508	230	8,471
1900	564	17,606	112	3,684
1901	279	7,246	107	4,269

Roughly speaking, for the privilege of making cakes and puddings we pay the foreigner some £20,000 annually, and when it is considered that both raisin and currant vines can be profitably grown in this State it will be agreed that this sum would be more profitably invested if placed in the pockets of our producers. It is probable that owing to climatic influences the ordinary raisin will be grown only on the banks of the Murray, and the northern areas wherever irrigation can be applied economically. The currant and the Sultana, on the other hand, can be profitably reared in almost all our wine districts. There is no doubt in my mind as to the early extension of currant vineyards; it is too profitable an occupation to go long abegging. When the home consumption is overtaken, the interstate trade will offer a wide field, before we need think of exports to foreign countries. Figures collected for me by our Statistical Department, which will be published in next Journal, show roughly that the annual imports of currants and raisins by the various States may be valued as follows:—

Victoria	£50,000
New South Wales	100,000
Queensland	30,000
Western Australia	10,000
South Australia	20,000
New Zealand	70,000
	£280,000

Conditions do not to an equal extent appear to favour the rapid extension of raisin vineyards we need, however, fear no retrogression, and even anticipate moderate progress. I estimate the area under currant and raisin vines to approximate at the present time some 1,500 acres. There is no reason why within a short space of time the home consumption should not be able to account for at least the produce of 3,000 acres.

INTERSTATE WINE TRADE.

Let us now consider the demands likely to be made on our vineyards by the interstate trade. Here we approach a subject of considerable importance and likely, I believe, to give a very considerable impetus to the progress of vinegrowing. An examination of Table IV. will show that South Australia has only Victoria to fear as a possible rival for the interstate trade.

TABLE IV.

Acreage under Vines and Yield in Wine in Commonwealth, 1896-1901.

	Victoria.		New South Wales.		South Australia.		Western Australia.	
	Acreage.	Gallons.	Acreage.	Gallons.	Acreage.	Gallons.	Acreage.	Gallons.
1896	30,275	2,226,999	7,159	885,673	17,950	1,743,090	2,294	—
1897	27,934	2,822,263	8,061	794,256	18,333	1,898,105	2,654	75,693
1898	27,701	1,919,389	8,083	864,514	18,761	1,263,998	2,960	89,099
1899	27,568	1,882,209	8,078	845,232	19,159	1,342,960	3,248	113,799
1900	27,550	933,282	8,278	739,668	19,438	1,558,285	3,325	86,801
1901	30,634	2,578,187	8,431	891,190	20,158	2,813,301	—	—

At the present moment our 20,000 acres practically yield more than Victoria's 30,000; and in my opinion this difference is likely to become still further accentuated in the near future. The phylloxera has now practically a clear field in Victoria, and the older vineyards will gradually die out, making place in some cases, it is true, to new ones on American roots. A reduction in the total yield of wine is bound to follow, for a time at all events. New South Wales is likewise in the toils of the phylloxera, and moreover her acreage is too small to enable her to successfully cope with us on the interstate markets. Western Australia is as yet new at the game, but may possibly in time prove a rival of some importance.

It seems inevitable that the State that occupied the best position on the interstate markets prior to Federation is likely to continue in that position now that interstate trade restrictions have been abolished. Table V. summarises the position of affairs for the five years immediately preceding the act of union.

TABLE V.

Wine exported to Commonwealth from South Australia, New South Wales, and Victoria, 1896 1900.

Exports.	1896	1897	1898	1899	1900
SOUTH AUSTRALIA	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.
to New South Wales ..	6,235	4 860	7,976	4,742	4,796
Victoria	14,894	15,126	18,219	3,345	3,748
Queensland .. .	3,796	5,489	5,408	7,186	6,082
Tasmania .. .	1,482	1,286	2,271	3,410	3,550
Western Australia ..	33,476	21,382	17,612	17,331	16,585
Northern Territory ..	1,844	1,893	2,067	2,295	2,244
TOTAL	61,727	50,036	53,553	38,309	37,005
NEW SOUTH WALES					
to Victoria	5,636	7,846	3,745	13,503	3,221
Queensland	1,881	2,536	4,535	3,464	4,395
South Australia ..	—	4	20	4	—
Tasmania	121	232	534	749	238
Western Australia ..	1,899	1,719	745	30	26
TOTAL	9,537	12,337	9,579	17,750	7,880
VICTORIA					
to New South Wales ..	956	669	990	1,063	943
Queensland	1,487	1,815	2,386	2,631	1,957
South Australia ..	152	12	186	170	27
Tasmania	1,492	1,387	1,627	1,375	1,309
Western Australia ..	8,483	7,228	3,596	1,945	1,434
TOTAL	12,570	11,111	8,785	7,184	5,670

In the teeth, therefore, of heavy protectionist duties South Australia was able during these five years to ship on an average 46,057 gallons to different parts of the Commonwealth. During this same period there are only 9,065 gallons to the record of Victoria, and 11,416 gallons to that of New South Wales. Under the free conditions that now obtain it is certain that we shall maintain our ascendancy, which I believe is due mainly to the superior quality of our wine and to the enterprise of our growers. In support of this it may be mentioned, by the way, that our exports to the Commonwealth totalled 76,735 gallons for 1901, and amounted to 63,778 for the first six months of 1902, whereas they were only 37,005 in 1900.

What is likely to be the amount of wine absorbed by the interstate trade during the next decade is the question now before us. Whilst it is perhaps easy to point out that conditions are such as to render an increase in our exports inevitable; it is certainly more difficult to gauge the probable volume of increased trade. I must indicate in detail the facts on which I base my calculations, so that it will be easy to rectify errors into which I may be led.

IMPORTS OF FOREIGN WINES.

I anticipate in the first place that with the duties in our favour we shall be able to oust some of the wines of foreign origin at present imported into the non-wine producing States. Table VI. shows the average imports of foreign wines into the various States during the five years preceding Federation.

TABLE VI.

Average yearly Imports of Wines of foreign origin into Australian States prior to Federation (1896-1900).

New South Wales	90,507 gallons
Victoria	42.949
Queensland	36,713
South Australia	18,318
Tasmania	2,960
Western Australia	42,431
Total..	233.878 gallons

Roughly speaking, in pre-federal days New South Wales, Western Australia, and Queensland imported annually about 170,000 gallons of foreign wines. We may suppose that interstate free trade will lower their joint imports to the level of Victorian and South Australian figures, representing about 81,000 gallons, distributed as follows:—

New South Wales	53,000 gallons
Queensland..	20,000
Western Australia	8,000
	81,000 gallons

Federation is not likely to modify the imports of Victoria, South Australia, and Tasmania. Should any reduction occur in the future it would be brought about by other factors. We take it, therefore, that Federation should enable colonial wines to oust 90,000 gallons of foreign wines off the market.

INCREASED AUSTRALIAN CONSUMPTION OF WINES.

If 90,000 gallons were to be looked upon as the net gain to the wine industry from the much vaunted interstate free trade, it would be a paltry gain indeed! Not a mole, however, would think of limiting its action to so restricted a range. To my mind free commercial relations must ultimately result in raising the local consumption of wine throughout the Continent and Tasmania to the South Australian level; and this progress must be made largely at the expense of the consumption of beer and spirits, both of which are largely imported. On these lines we may summarise the probable consumption of wines in the different States in the near future as follows:—

South Australia	800.000 gallons
New South Wales..	3,022,000
Victoria	2,666,000
Queensland	1,111,000
Western Australia	400,000
Tasmania..	377,000
	8,376,000 gallons

Prior to Federation, according to Coghlan, the local consumption of wine was just four million gallons below the above total. I anticipate, therefore, that Federation should find an outlet for 4,000,000 gallons of wine. I would not have it understood that I am under the impression that it would be possible to dispose of this amount at the present moment. Commercial enterprise must create the demand, and new vineyards must be established to meet the demand that must necessarily arise.

SOUTH AUSTRALIA'S TRADE QUOTA.

It will, of course, be said that I cannot possibly anticipate that the whole four million gallons will be furnished by South Australia. I am ready to admit that both Victorian and New South Wales growers are bound to a certain extent to benefit by the new openings that will arise; but given the position in which they are placed I cannot see that they are likely to derive much profit from our competition. It is possible, too, that within a short space of time Western Australia will be in a position to supply her own requirements. Nevertheless, when it is remembered that we were able to force important quantities of our wines on the markets of wine-producing States, prior to Federation, it is difficult to escape the conclusion that the bulk of the new demands will be supplied from our vineyards. I take it, therefore, that taking into consideration our present output at the lowest computation interstate trade should enable us to dispose of three million gallons of wine as soon as the markets have been properly exploited. Allowing 10 per cent. for waste and evaporation prior to the attainment of market condition, this would in reality represent three and one third million gallons, and correspond to the produce of about 21,000 acres.

EXPORT TRADE.

The export trade to countries beyond the Commonwealth is a question of very considerable interest, and I should have liked to have been able to dwell on it in some detail. I feel, however, that I have perhaps already unduly abused your patience. I shall therefore content myself with urging that no amount of profits in interstate trade should ever induce us to neglect the true exports to foreign countries. The distant markets are more difficult to exploit competition is keener; they are, nevertheless, destined in times beyond the reach of my modest computations to be the scenes of our future commercial triumphs. Let us therefore beware of losing the ground we have already acquired. During the five years immediately preceding Federation our wine exports to the United Kingdom and other countries averaged annually about 431,000 gallons. I will assume that for some time to come these exports will not absorb more than the produce of about 4,000 acres.

BRANDIES, SPIRITS, AND VINEGARS.

Lastly we have a portion of our vineyard area devoted to the manufacture of spirits and brandies and vinegar. Probably at the present time the amount of wine distilled or converted into vinegar varies between 500,000 and 700,000 gallons annually. Unquestionably interstate free trade should admit of further development of this industry, particularly in view of the fact that under the present regime only wine spirit can be used for fortifying wines. Were some protection accorded to real vinegar, as against mixtures of acetic acid and water, important developments ought to be expected in this direction. In any case, I am disposed to accept the higher figure, 700,000 gallons, as representing the requirements of the near future. This would correspond to about 4,400 acres.

FUTURE DEVELOPMENTS UNDER INFLUENCE OF FEDERATION.

Finally, gentlemen, after having lead you through a somewhat intricate maze of figures, let me arrange in tabular form what I anticipate to be the future development of our vineyard area under the influence of Federation:—

Home consumption of wine	5,000 acres
Interstate wine trade	21,000
Export trade..	4,000
Brandies, spirits, and vinegar..	4,400
Table grapes..	2,000
Currants and raisins	3,000
	39,400 acres

Our present area covers some 20,000 acres. I am confident that if we meet the future with the same energy and enterprise with which we fought the difficulties of the past, this same area should be doubled within the next 10 years.

The Chairman—Professor Perkins has not given us much information in reference to the cost of production per acre.

Professor Perkins—I did not think it was necessary. I was dealing with the return for the whole of the State. Of course the cost per acre is greater than wheatgrowing. I did not intend to enter into the question of profits. I simply represented what would be the revenue. The cost, I reckon, would be about £4 per acre, including interest and everything.

Mr. Hector (Port Pirie)—I would like to ask how Professor Perkins places his calculations at 160 gallons to the acre. Did he not think that that was a very low average for South Australia?

Professor Perkins—I do not think so; if anything it is a little above the average. The statistics are for the whole of the vineyards, but I know there are a number of vineyards in the State which will give 300 gallons per acre.

Mr. Hector—What is about the minimum average crop for South Australia? I should think 150 gallons per acre about the lowest average that could be procured. I cannot understand vines, even the wine varieties, producing less. My experience has been about 700 gallons.

Professor Perkins—Some only get half a ton. In New South Wales, where there is a moister climate the average is 180 gallons.

Mr. T. Hardy—I believe Professor Perkins's calculation that the average is not more than 160 gallons per acre is correct. I believe there are very many old vineyards which are wholly unproductive, and are only fit to be grubbed up. The whole of the McLaren Vale district, including the hillsides, has an average of something like 250 gallons per acre. I do not think that this is going to be exceeded very much, although I do not know what improved cultivation may do. Professor Perkins has told us that by better cultivation and the conservation of winter rains we are bound to have heavier yields of grapes.

Mr. Rathbone (Davenport)—Does irrigation produce a larger quantity of wine at the expense of quality?

Professor Perkins—Yes, undoubtedly. I do not think it advisable to grow grapes for wine where you have to irrigate.

A Delegate—Can Professor Perkins tell me what artificial manures are the best for the vineyard, and what sorts he would recommend?

Professor Perkins—Any of the superphosphates will do. Th question is whether the owner of the vineyard wants the manure to act on the plants at once. With bone manure he would have to wait for beneficial results. One thing I wish to recommend, and that is, do not spread the manure uniformly over the soil. You cannot manure in proportion to the bulk of soil, and if you attempted to do so some of the manure would be lost. The practice is to put it in the centre furrow where the roots of the vines will reach it.

Mr. Hardy—I would like to say we find a great advantage in putting the manure between the furrows. It does not encourage the growth of weeds against the vines.

The Chairman—It is a very important paper, and I hope the delegates will give it careful consideration. I think the Professor should have given us the cost of producing a grape crop as compared with the cost of a wheat crop. We have been given to understand what is the cost of producing an acre of wheat, and we want to know what is the cost per acre of vines. We want to know this to ascertain on what side of the ledger we will be if we enter into these undertakings.

Mr. McEwin (Brinkworth))—I am hardly interested in the wine industry at present, although I am indirectly interested. I think that the Professor should have gone into the question of the cost of planting vines, because after all everything goes back to that. I maintain that wheat could not be profitably grown under 2/6 per bushel, and doubtless a certain yield would have to be obtained from grapes to make them pay. To bring vines to maturity would take several years, and I would like to know what the Professor has to say about this. In most localities I think it would take four or five years.

Professor Perkins—They are in full bearing in eight or nine years.

Mr. McEwin—A man must understand that a particularly good spot of country is required for the growing of vines. It is no use planting them anywhere, because if you do they will soon be rooted up again with the plough. I know a grower in Clare who planted 70 acres of vines. Two years later he ploughed the whole of them up. There are many similar instances. People should understand what they are going into when they take up the wine industry. In my time in the south there was certainly no inducement whatever for increased planting. We have a vineyard, which is now about 40 years of age, and as in the whole of that time we have had experience in wheat and vine growing I think it is more profitable to take our chance of returns from wheat. I notice that the industry has increased in the last ten years, and it would be interesting to know whether the Professor could tell us whether it would be better to take up a good acreage for vine instead of wheat culture. It is a question as to a practical proof of the advisableness of adopting vine-growing or remaining with agriculture. I see no reason why a few acres should not be devoted to vine culture. I believe if some inducement were offered it would be done, and possibly many would be converted from hay-growing, &c. Every effort should be made to show the people that the business would prove profitable.

Professor Perkins—I did not lay myself out to prove that vinegrowing is a paying concern, because there is abundant proof that such is the case. We have evidences of this on all sides. With judicious management the business can be made to pay handsomely. In reference to the extension of vinegrowing the Minister of Agriculture is, perhaps, a little too optimistic. In his speech the other night he said that we should have half a million acres under cultivation within 20 years. I do not expect that. You must understand that you cannot push this industry so rapidly as you can do with cereals. With wine you have to find a market to provide a safe basis for developmental work. As a matter of fact I should be sorry to see the industry make rapid strides. This, I fear, would result disastrously. The industry must progress slowly, because with a boom we should find ourselves in the position of Victoria, after the bonus for planting, i.e., plenty of vines, but no market. I have been asked for an estimate of the cost of vinegrowing. Taking into consideration the money necessary for bringing the vines into bearing—that is the initial outlay and working expenses, interest, &c., I do not think the cost would be more than £4 or £5 per acre. Taking my low estimate there must be about £4 average profit on every acre of vines grown in the State. I am quite prepared to work out a statement to show that the business is profitable. I do not want to see 20,000 acres planted in one year, or even two years. I want to see the progress in area march with the extension of a market, and if that is done our industry will proceed on a safe business basis. In my paper I wanted to show that at the present moment conditions are such as to render advisable the further extension of the vineyard area. I pointed out that it need not be antagonistic to cereal growing. It cannot be suggested that the area will ever approach that under cereals.

Mr. Pavy—It is not the man who sells the grapes who makes the profit, but the man who sells the wine. It has been stated that the return to the growers is £9 per acre, but I know many in McLaren Vale who do not get £9 for their grapes whatever Mr. Hardy may get for the wine.

Mr. Hardy—There is a profit for both the grapegrower and the winemaker. I speak from facts and figures, &c., concerning one of the largest vineyards in McLaren Vale district. The prices that have been paid for the grapes during the last two or three years leave a very substantial profit to the grapegrower apart from any question of the business of the winemaker.

Mr. Pavy—Have many vineyards realised £9 for their grapes?

Mr. Hardy—I do not think they did.

Mr. Pavy—What profit did they make, then?

Mr. Hardy—I calculated that some have made £7 in gross returns.

Mr. Pavy—I know individuals who have sold grapes for £2 per ton, and only harvested about 2 tons to the acre. The cost of keeping the land cultivated would be about £2 per acre per year. Taking the growth at five years the expenditure would be about £10 before you would get any practical returns. The prices and glowing descriptions are all right on paper.

Mr. R. M. Smith (Golden Grove) We grow both wheat and vines, and consider that the vines pay us well. We have a patch about ten years old, and our returns for the last five years have been about 2 tons to the acre. We have sold these grapes at various prices in the last two or three years, and have averaged about £4 5/ to £4 10/, which works out at about something like £9 per acre. It has cost us about 50/ per acre for cultivation. In addition to this there is the cost of pruning and harvesting the crops, which together runs away with about 15/ per acre—or a total of about £3 5/ per acre. What is wanted for the wine industry is the guarantee of reasonable prices. If that could only be assured the business would be extensively adopted.

A Delegate—That is the point.

Mr. Smith—We do not want big prices so much as permanent figures, so that we might know what to expect. We cannot grow grapes at 30/; and, for the business to pay, something like £3 is wanted. If that were guaranteed an important and necessary impetus would be given to the industry.

Mr. Hector—I would like to ask Professor Perkins what is the average price for wine?

Professor Perkins—It was 1/3 per gallon for last year's wine.

Mr. Hector—That price is too high. I know a great many people who sold it at 1/ per gallon, and even at that figure they have to keep it several years before they get a sale.

Professor Perkins—Very few; only those who make a mess of it. (Laughter.)

Mr. Hector—I have known the best distilling wine sold at 7d. That has been my experience.

Professor Perkins—Probably you have made a mess of it. (Laughter.)

Mr. Hector—I am certain I did not. I think 1/ per gallon a fair estimate of the price, and the utmost that can be placed on new wine.

Mr. W. F. Snow—The Professor has dealt with a most interesting subject in a very valuable paper. I wish particularly to refer to that part of the paper where he refers to the factors that are lkely to assist in the progress of the industry in the future, namely, "1, increased demand for the home market; 2, new demands of the interstate trade; 3, increase of the general export trade." I believe the future progress is bound up in the English market. It is all very well to talk about interstate free trade increasing the demand, but we should remember that the whole population is only about 5,000,000, while that of the old country is 40,000,000. A few years ago colonial wine was looked upon in England as rubbish, but it is not to-day. I have had experience as a wine merchant in London, and know exactly how the trade is conducted there. I may say there is a close corporation among those connected with the trade, which can be carried on in only one or two ways. First of all the trade should be pushed vigorously by a first-class agent, who would have to go to the large wholesale houses to get them to trade, so that the wine may go almost straight to the consumer. I believe the time of going to the merchant has gone by. The wine merchants of London have so many vested interests, such as being partly concerned in vineyards in France, &c., that they naturally do not care to deal in wine from Australia, especially as there is a probability of their not being able to get the same class of wine the following years, which is a great drawback. Another disadvantage is that there is a great trust or combination in the trade in London. Our friend, Mr. Burgoyne, has doubtless rendered great assistance to Australian vignerons in helping to build up the trade in our wines, but that is no reason why he should have a monopoly of it. When you buy Australian wine in London you do not get the beautiful article you get here. I think the best way of expanding the trade is to take action in the way I have suggested, and I am certain that if that is done a far greater demand will be created for our wines and far better prices will be obtained. We make one of the finest Burgundies on earth, and if a representative of good repute were sent to England he would get 36/ to 42/ per gallon as easily as we get 1/2 now. I would have liked Professor Perkins to have elaborated much more on the point as to the possibilities of trade in the future with countries beyond the Commonwealth. I wish to emphasise the fact that our wines are not pushed in England as they should be, and we should not rest content with producing wine without trying to sell it.

The Chairman—I think more information should have been given concerning the suitability and extent of the country we have for the cultivation of the vine. We must not run away with the idea that the land we have for growing vines is unlimited. There is a strip of country running along the foot of the hills near Adelaide where the vine flourishes. It is of great uniformity for a good many miles, and probably its width is three or four miles in extent. The same may be said of the country at Angaston. When we get into the hills districts, the country is more broken, and the different characteristics are very marked. In the valley of the Onkaparinga, at Woodside, I know of some vineyards the grapes from which yielded the largest quantity of juice. Another little spot in the valley of the Bremer, on the eastern sides of the Mount Lofty range, grew grapes from which the highest quality juice is obtained. In the Bremer Valley where the vines are growing there is an underlying layer of red basaltic clay. There is similar clay at the place mentioned at Woodside, but fifteen chains distant, on the western slope of the hills, the conditions are unfavourable for the cultivation of wine grapes. This is a matter that should receive careful consideration, and people should be advised to plant vines only in those situations where the conditions are favourable for them.

Professor Perkins—If I had touched upon all these subjects I would have had to prepare a book and not a paper.

The Chairman said as there was a few minutes to spare he would ask Mr. Fisher, of Tatiara, to initiate a discussion on

BREEDING ROADSTER HORSES.

Mr. Fisher (Tatiara)—We have some good horses down in the South-east, and the subject of horse breeding has been well discussed in our branches. What we want to know is what the Congress considers a roadster, and how to breed it. We have had what is called a roadster at our show taking prizes year after year. It belongs to a storekeeper, and the question that has been frequently raised is, "But. is it a roadster?" Some say unhesitatingly that it is not. There is a gentleman in our branch who knows a great deal about horses, and he describes this same horse as a mongrel. I would like to have the question of what is a roadster ventilated.

Mr. Edwards (Murray Bridge)—It is my opinion that there is no such thing as a roadster entire. A roadster is a good horse to breed, but not a good horse to breed from. That has been my experience, and we have had many instances of its truthfulness.

Mr. McEwin (Brinkworth)—My experience is that to get a first class roadster you must put a pure draught horse to a blood mare. When we speak of a roadster I presume we mean a horse that will take the collar, and I find that the progeny of the draught horse takes the collar better than the blood. A lot of prizes have been won by roadsters that have been bred from Old Fireaway, one of the heaviest draughts introduced into the State. My experience is that you get the most durable and reliable horse from the pure draught and the pure blood mare. I have travelled very long distances with some of my horses and I have found that they take a lot of holding and are always eager and vigorous.

Mr. Dall—The subject is a most important one because we really want the roadster in South Australia. I move "That in the opinion of this Congress the best roadster is bred by a pure blood stallion from a medium draught mare, and in no case should the roadster horse be kept as a stallion."

Mr. Hacket (Meningie)—I second the motion. Mr. McEwin makes a mistake when he says that the cross should be by a draught horse and a blood mare. I understand a roadster to be a horse that you could ride 50 miles to-day and do the same the next day. We want a horse with activity and durability. The reason that you cannot breed from a roadster horse is, being crossbred, its progeny will throw back to different types of horses.

Mr. McEwin (Brinkworth)—I move as an amendment "That this Congress is of opinion that the best class of roadster is bred from the draught entire out of a pure blood mare." One of the difficulties of the breeder was that it takes a long time to know what he really was breeding. Until the young horses were broken and tried their merits could not always be determined, so that a man might breed in a particular line for three or four years before he could be quite certain about the results.

Mr. Pavy (Crystal Brook)—I support the motion. You cannot get good roadsters by breeding from crosses. You must keep pure stock. People should breed from two pure bred horses.

Mr. Wilks (Mt. Bryan)—I have had experience extending over many years and always obtain roadsters by putting a draught horse to a light mare.

Mr. J. O'Dea (Kapunda)—Much depends upon the quality and breeding of the mare. To say that an animal bred from a blood stallion and draught mare is a mongrel is a great mistake. Fireaway was an exceptionally good stallion, but he was not a thoroughbred nor a draught horse. He was the sire of a number of good roadsters, and yet some people in this room had said that he should not be used for breeding purposes.

Mr. McEwin—Old Fireaway was a thoroughbred draught, who was the sire of many a good horse. You are speaking of his son.

Mr. Dall (Nantawarra)—If a draught horse is put to a blood mare the progeny are too heavy in the body and too light in the bone. This difficulty is overcome by breeding from a blood stallion and a medium draught mare. In breeding from a cross animal you are not sure if the offspring will follow the blood or the draught strain. I wish to emphasise this fact, you should not breed from crossbred entires.

The motion was carried.

The Chairman—I want to ask a question:—Has any appreciable improvement been seen in the quality of the roadster during the last 20 or 30 years? The reason I ask this is because I was told many years ago that horse-racing was going to improve our roadsters. Race meetings have been held throughout the country during the past 15 years, and has it resulted in an improvement of the stock?

Cries of "No."

The Chairman—I certainly do not think that the horses of to-day are more hardy.

Mr. McEwin—I saw some beautiful horses in the streets of Adelaide to-day. I do not believe that horses have deteriorated.

Mr. Dall—The use of the roadster sire has been the cause of the deterioration of the roadster. (Hear, hear.)

Mr. Edwards—The cause of so many mongrel entires being kept among the farmers is because the majority of the farmers would go to the owner who charged the lowest price. In the olden days there were less stallions, and most of them left good stock. Consequently the stock in years past were better than the horses of the present day.

A Delegate—There should be a tax.

Mr. Rankine (Strathalbyn)—Some horses brought from Sydney years ago have never been equalled. I believe they were a cross of the Arab. They were not heavy, although some had strength and bulk. I would not care to give advice how to breed a good roadster, but know one when I see it.

Wednesday Evening, September 10.

The Chairman—I wish to introduce Professor Towar, the Director of the RoseworthyAgricultural College. He comes here with considerable American experience.

Professor Towar, who was well received on rising, said:—It gives me great pleasure to meet such a large body of practical men. I have enjoyed two or three trips about this State immensely, and I hope to have a good many other opportunities of being able to visit you at your homes in the country to get better acquainted with you and the agriculture you practice. I came to you as a "green foreigner" from the other side of the Pacific Ocean, and a warm cordial reception has been extended to me on every side. I received a kind letter from your ex-President, Mr. Krichauff, before I left America, and when I reached Sydney I received a message from the Minister of Agriculture welcoming me to these shores. Again, on arriving at the Serviceton railway station a telegram was there further welcoming me, and on reaching Adelaide I was met by a representative from the Minister, officers and students of the Roseworthy Agricultural College, your old friend, Mr. Molineux, and others. If I have been asked one question once I have been asked it 100 times. It is, "How do you like Australia?" I can read in that question a little sense of pride of the country in which you live. I am pleased to say I like Australia. I like the climate and food, I like the men, I enjoy the society of the women, the boys are a good lot of fellows, and the girls—

well the boys will speak for them. I have been told that you have been experiencing unfortunate seasons, and am glad you are getting a shower to-night.

Professor Towar then read the following paper:—

SOME IMPRESSIONS OF SOUTH AUSTRALIAN AGRICULTURE.

In the geographies studied by the American school boy, the island of Australia is a small spot in the south-east corner of the world's map. Its inhabitants are naked blacks, with long hair covering their entire bodies; the principal animals are the kangaroo and the duckbill; and the climate is so hot that the boy imagines these duckbills laying boiled eggs. The boy learns that the beginnings of civilisation are marked by the landing of great numbers of English convicts, hares, and rabbits. He wonders what Christmas and New Year would be like in haying and harvest time, and how it would seem to celebrate the Fourth of July in midwinter; but neither the boy nor his father has any real conception of the vastness of this great country, the wealth of its mines and agriculture, and the magnitude of its farming operations.

It is not until one lives in this country, sees its four and six furrow ploughs, its broad sweeping harrows, scarifiers, rollers, and drills, the enormous loads hauled over your good smooth roads, the large fields, and the immense sheep stations, that one realises the extensiveness of Australia's agriculture, and the ingenuity of her people in economising man labour.

FERTILISERS.

The universal need and use of commercial phosphate surprises the stranger when he considers how young the State really is, and yet a study of some of the practices which have prevailed in the past, and which I observe still continue, suggest a reason for this early resort to a commercial supply of plant food and soil stimulant. I have learned of your history — burning of stubbles and straw stacks; I see your bare fallows, which are to be exposed for months to the burning action of a tropical sun, and notice the immense piles of stable manure wasting in the barnyards, and I at once guess why outside sources have so early to be drawn upon in order to make the crops grow.

A prominent farmer recently told me that it was much better to harvest the grain with the stripper, for the straw left so evenly distributed in the fields seemed to greatly benefit the land. Yet that same farmer asked if it paid to haul out the stable manures and rotted straw stacks and spread them on the fields.

These few outward signs of the management of the coarse manures on the farms suggest to me some reasons why crops fail, and the phosphate dealers do such a good business. I am most forcibly impressed with the importance of conserving with greater care all of these vegetable means of soil improvement.

The virgin soil of this State seemed to be fertile enough, and I cannot believe that the few crops already removed have so completely exhausted the natural supply of mineral elements as to demand such liberal applications of plant food as are now being administered. I can understand why the application of soluble phosphates makes up in part for the absence of humus, and I recognise the great good the introduction of phosphates has done, and is still doing; but on the other hand, I verily believe that the presence of as much humus as was contained in the virgin soil would provide the soluble phosphates now artificially supplied, and furnish other elements and conditions of vastly greater importance as well.

Most agricultural soils are quite liberally supplied with phosphates and potash, but in such form as to be but slowly available. They are slowly dissolved by the acids secreted by the roots of the plants and the acids created in the decomposition of humus. It therefore follows that unless the South Australian soils are especially deficient in their supply of phosphoric acid, this important element could be obtained, as it was in your virgin soils, could we return the soils to the physical conditions which prevailed in those pioneer days.

To the stranger but slightly acquainted with the conditions and practices, this is the impression — that the humus of the soil has been rapidly consumed, and that no special effort has been made to renew the supply, or even maintain that now on hand. Burning stubbles, close cropping, waste of coarse manures, and summer fallowing, impress me as the principal reasons why the fertility of the South Australian farms has become so largely exhausted, and I cannot believe that your fields will continue long to produce profitable crops by the mere application of superphosphates.

If I conjecture rightly, the South Australian farmer is making a history similar to that made by the early farmers in the older American States, which resulted in exhaustion and abandonment of the farms taken up by the first settlers. These farms are now becoming reoccupied (thanks to the agricultural experiment stations), and profitably cultivated, through the practice of an agriculture aiming at the greatest possible utility of vegetable manures. Chemical analyses reveal in the stable manures a quantity of plant food sufficient to warrant paying as high as a pound a cord for them; while their chemical and physical effect on the soil place them far in preference to the commercial fertilisers, wherever their application is reasonably practicable. The farmer who recognises the need of proper renovation of a run-down farm begrudges not his fields some of the herbage they produce, and frequently indulges to the extent of ploughing under a good crop as green manure.

Besides furnishing food for the succeeding crops, and aiding to dissolve and digest the elements of plant life locked up in the soil, the presence of humus has a very beneficial effect upon the supply of moisture. It renders the soil more open and porous, thereby increasing its capacity for the reception of moisture. As a surface mulch it will remain more loose and effectual than the pure sand and clay. It serves to hold the soil from the shifting effects of wind and running water; it improves the texture of the soil, and renders it more congenial for plant growth.

In this connection, let me add that while handsome prices are being received for the great procession of loads of hay, chaff, and straw, rapidly moving to our seaports, and thence to other shores, it would be far better for our agriculture if that coarse feed could be consumed at home, and only such concentrated and watery products as meat, wool, butter, grain, wine, and fruits removed from the farms.

CROPS.

An American is impressed at the limited variety of your farm crops. Almost no broad-leaved and deep-rooted plants are grown. I have no doubt that trials have been given all the crops so dear to the American and European farmer, yet I still wonder why some, which thrive in our arid regions, do not grow here, and I will not be satisfied until I shall have given some of the most promising ones a chance to demonstrate their possibilities.

SILO.

During the long summer drought, which I have not yet experienced, I am wondering what effect the feeding of silage will have on producing capacity of your live stock. I believe the silo is the friend and helper of the farmer in the arid regions, and its more general adoption and application is worthy of trial. The silo was originally built to furnish green and succulent feed during the long winters in the colder climates, but of recent years it has been found of equal or greater value, especially with dairy farmers, during the summer drought, when all forage is dry and dead.

TOOLS.

I notice with admiration the readiness with which the South Australian farmer adopts improved and labour-saving tools, and while I take a just pride in meeting here many products of the American shops, I am surprised—almost ashamed—at the enormous prices you are paying for these American made tools. Our farmers in the States are paying for steel beam, single-furrow ploughs, 30 to 50 shillings; adjustable steel wheel spring-toothed harrows, 17 teeth, £3; two-horse grain drills, with fertiliser and grass seed attachments, £15; six-foot twinebinder harvesters, £20 to £23; a good, well cushioned, hooded single rubber-tired carriage, £12; and other things accordingly.

If the American dealers are asking your agents unreasonable prices for their wares, then why not start the wheels moving in some of your silent shops, give work to your vast army of unemployed, and build these implements here. If your agents are over-greedy and exorbitant in their claims for profits, order through your Farmers' Co-operative Association, direct from the manufacturers.

LIVESTOCK.

The magnificent Clyde and Shire horses that in their way grace the fields and stables of the South Australian farms are certainly a credit to the State, and a living monument to the foresight of the pioneer breeders who ventured the expense of the early importations, but the racer and pony seems to have established themselves on the farms in numbers out of proportion to the actual demand and economical utility of animals of their stamp. The average American will go as far to see a race of trotters or pacers as the average Australian to see a hurdle or a steeplechase; but neither the American nor Australian farmer can afford to keep these frail beasts to do his heavy farm work. The trotter is bad enough as a farm horse, and the racer, I fear, is no better.

I would not be understood to advocate that the farmer has no use for the light horse. On the contrary, I deem it very important that he have an animal that can go on the road, with good speed, style, and endurance, while in numerous operations on the general farm he is more clever and far more desirable. My limited observation convinces me that the country is in need of more good draught and heavy carriage horses.

The Jersey cattle, while they have no doubt improved the quality of the milk, they have so reduced the size of the common stock as to render hopeless the profitable production of good beef. The same thing exists in the States, and the beef interests are now condemning the Jersey for her damaging influence.

I have as yet seen but little of the sheep and swine. They impress me as excellent, and above the average of American stock. I feel very certain that the sheep of the ordinary farms, and even the large stations, far surpass the stock in every respect that would be found in similar conditions in the States; while the stud sheep are better than the best stock of the majority of our American breeders.

COUNTRY ROADS

The South Australian Government may well be proud of the progress it has made in improving its facilities for primary transportation. The country roads are the arteries of the Government railway system, and the improvement and maintenance of these thoroughfares, while adding to the ease and comfort of travel, enhance the prosperity of the country, bring the isolated farms and farm homes nearer together, and give material aid to every industry and interest in the entire Commonwealth. You are to be congratulated on the progress you have made in the "good roads" movement, and the American must blush at comparisons, even though he might say you are maintaining more miles of public highway than are absolutely necessary.

AGRICULTURAL COLLEGE.

It is certainly a good and welcome outlook, upon beginning my work at the Agricultural College, to find the institution standing so high in the estimation of the farmers of the State. It is a compliment to my predecessor and those who laboured with him in bringing the College up to its present high standing. I am not disappointed in what I find at Roseworthy, yet I feel that the course of study might be expanded, the facilities enlarged in certain directions, and shorter special courses arranged for the accommodation of those who cannot afford to spend the necessary two or three years of residence at the College required to complete general courses. No Agricultural College can prosper and give good to those it serves if it has not the support and sympathy of those whom it is intended to benefit. I am highly pleased and favourably impressed with the loyalty of the citizens to their College, and shall look for a continuance of that loyalty and hearty co-operation which shall make the College grow, and its influence felt more and more.

LOOKING FORWARD.

As the conservation of the waters in the elevated districts is furthered, more diversified farming will become possible. More live stock will be kept, additional crops be grown, and through irrigation the great possibilities of the State in growing fruit and vegetables will be developed.

When the electric car displaces the snail-paced tramcar in the city of Adelaide, the advantages and delights of rapid transit will spread like a contagion, and (I speak from observation) many of the inland towns will bridge the expanse that separates them from the busy world with an hourly service by electric car to the city, or, at least, the steam car line.

Telephones in country homes and a daily mail delivered at the door are among the recent conveniences which certain American farmers find almost indispensable, and the Australian surely will not wait long until these means of immediate communication with the whole world are furnished him.

I look forward to a more complete organization of the Australian farmers. Your Agricultural Bureaux and Farmers' Co-operative Association are means to that end, but their membership is too limited. A national organization for the social, intellectual, and financial improvement of the farming classes, to which will belong not only the men of mature years, but the farmers' wives, and sons, and daughters, with local branches meeting monthly, fortnightly, or even weekly, to enjoy a social hour, discuss agricultural and domestic problems of a general nature, and, possibly, deal in co-operation with some of the business transactions of the farm and home, will prove a power for good.

This in brief is a description of the Grange, which in Canada and the States is a recognised agricultural force, and, I believe it, or a similar farmers' organization, would satisfy a long felt want among the South Australian farmers.

Here every farmer could learn and profit by his neighbours' experiences; the farmer's wife could meet, know, and enjoy the acquaintance of her neighbours; while the rural youth could find some pastime among congenial companions beyond the constant round of drudgery which so often drives the boys and girls away from the country home.

This has been a discourse on early or initial impressions, many of which may be immature and unstable. Time and experience may alter them, and I will, I assure you, be the first to recognise the change.

Improvments in the methods of farming are sure to come in the future, as they have in the past. Observation, science, and invention will continue to scatter their helpful products in the farmer's way, and the future tiller of the soil is bound to meet his duties, trials, and difficulties with greater wisdom, keener foresight, and grander success.

Mr. Freeman (Ardrossan)—Would the Professor tell us the hours of labour in America in the manufacture of implements for the farm, and the wage?

Professor Towar—I cannot say definitely, because there is no general law with regard to the hours of work. I suppose the average would be from 9 to 9½ hours. The wages paid vary considerably, the rates being regulated by the efficiency of the men and the character of their work. The piecework system is generally adopted. The range would be from 4/ to 16/ a day. Most of the mechanics get 16/. The men at the head of a department in the manufacturing shops would get as high as £1 a day. A fair average is about 9/ a day for men in shops where the harvesting machines are made. They have so many machines to make machines that it takes few men to work them.

Mr. Jamieson (Orroroo)—The fact is that most of the factories will not sell to any one. They have their special agents, and you have to get the machines through them.

Professor Towar—That is probably the case. Still I know that a good many firms not represented by these special agents would be glad to sell machines in Australia.

Mr. McColl (Richman's Creek)—What is the rainfall in the State you came from?

Professor Towar—From 30 to 35 in. This year we are having about 45 in.

Mr. McColl—I think the Professor will later on alter his views in regard to farmyard manures, especially in the dry north, where we have to grow crops with from 11 to 12 in. of rain. We find that the farmyard manure forces the crops on when there is any moisture in the soil, but such crops are cut by the first hot wind, or go off for want of rain.

Professor Towar—Of course, I may be wrong. If you plough under coarse manure I think you are likely to shut off important sources of supply from the subsoil; the manure must be incorporated in the soil some considerable time before the seed is sown. Every effort should be made to renew the supply of humus to the soil.

Mr. Stuckey (Millicent)—What method would the Professor adopt in reference to stable manure?

Professor Towar—I would advise you to put on the stable manure some considerable time before you dealt with the crop. Perhaps it would be best to distribute it in the preceding year. My idea would be to leave the ground for one year, and put your stable manure on so that sufficient time would be allowed for decomposition.

Mr. Stevenson (Mallala)—The Professor in his paper said that he could not believe that the crops had exhausted the fertilising ingredients of our originally fertile soil to such a degree as to demand the liberal application of plant food. Does the Professor know that we have been growing wheat in South Australia for 60 years, and does he not think that that period is sufficient to exhaust them without having the rotation of crops?

A Delegate—We have not been growing wheat for 60 years on the same land.

Mr. Stevenson—We have in some districts, but supposing that the period is only 40 years I do not think the argument is materially altered. On more than one occasion Professor Lowrie told us that with continual cropping with wheat the phosphates had become exhausted, and that the land needed a renewal of that which had been taken out of the soil.

Mr. Molineux—He referred to soluble phosphates.

Professor Towar—I have seen a few analyses of soils, some of which have been growing crops for a number of years, and I believe the lowest showed two one-hundredths per cent. of phosphoric acid. I do not know how fertile that soil was at the start, but of two one-hundredths per cent. there would be the equivalent phosphoric acid that you would get in applying about 4,400 lb. of 36 per cent. acid soluble phosphate to the acre. The phosphate is in the soil. It remains for the scientific farmer to devise some way of getting it out. I may be wrong in assuming that you could get back into the soil organic matter such as you find in virgin soils. I have not had sufficient practical experience to give a definite answer to the question. You want to get this organic matter into the soil, as it creates acids which cannot fail to be helpful in dissolving or rendering soluble the plant food already in the soil. I have not yet travelled about the State to any extent, so that I do not know as much as I would like in regard to the application of artificial fertilisers. I understand that from 80 lb. to 100 lb. of super. is found sufficient for your soils. The idea is to get back into the soil a good supply of food—as much as you had in the virgin soil.

Mr. Stevenson—How are you going to get it back?

Professor Towar—Now do not ask me that yet. As far as my experience goes I should suggest green manures.

Mr. Stevenson—We cannot grow them.

Mr. W. Hannaford (Riverton)—I wish to ask the Professor if he does not think that we add to the store organic matter in the soil by the use of phosphates?

Professor Towar—Certainly. When I was at Port Elliot I saw very good evidence of that presented.

Mr. Henley (Finniss)—Four hundredweight of guano was used on certain land at Port Elliot years ago, and the ground has been better ever since.

In reply to a question as to how large the farms were in America to which telephones were supplied, the Professor said from 40 to 600 acres. With regard to the rural delivery of mails he thought that 25 miles' travel would serve 100 families. Thus it would be seen that the districts were more thickly populated than they were here.

Mr. W. Miller—In reference to the proposed short courses at the Roseworthy Agricultural College, are any conducted at the college in America from which the Professor came; also in the rural districts?

Professor Towar—Special subjects, such as dairying, are conducted at the College. In collaboration with these series agricultural, horticultural, and other experts travelled about the country instructing farmers and orchardists. They stopped about three days in a place, and usually several men expert in their particular departments attended the meetings. Frequently they carried with them milk testers and other appliances used on the farm for the purpose of giving instruction.

Mr. Kennedy (Kadina)—I would like to ask the question, do you think farmers make a mistake by breeding Jersey cattle? Supposing you get £12 out of a Jersey cow in milk and butter, and £8 from another cow of a different breed, but at the end of that time the Jersey cow is practically worthless as butcher's meat while the other can be sold at a big figure, which cow would you advise me to keep?

Professor Towar—The one you would get the most money out of. (Laughter.)

Mr. Allen, M.P.—I wish to ask if they have introduced the red rust into America yet; what is the average price of agricultural land; and what land tax the farmers are compelled to pay?

Professor Towar—Americans have not only introduced the red rust but have dispersed it, too. (Laughter.) The average price of land was all the way from £1 to £100 per acre. The average farms of 160 to 300 acres in extent were worth about £6 or £7 per acre. Perhaps there would be orchards, buildings, and other property on the farms. A ranch of 1,000 acres, with only one set of buildings, would be cheaper, although the soil would not be so fertile. The land would be similar to that round Gawler and Roseworthy, and was worth about the same price—£4 or £5 per acre. The land tax also varies, but now is about 1 per cent. per hundred. Supposing a farm is assessed at £1,000 the owner would have to pay a tax of about £10. The assessed value is something like 55 to 60 per cent. of the actual value. The £10 would pay for the rate tax, school tax, and other taxes.

In reply to a question as to how many sheep American land, valued at £6 per acre, would carry to the acre, Professor Towar said sheep would not be depastured on such land all the year round. Land on the very best farms will carry six sheep to the acre, but then feed is grown for them, but ordinary farms will not carry so many. There are dairy farms in America the owners of which, by buying some green fodder, enriching the soil, and studying the best kind of farm economy, keep a cow to the acre. A cow is considered to be equal to 10 sheep in this respect, but the flockmasters there are not so far advanced as the dairy farmers.

Mr. Cornish (Gumeracha)—Can the Professor tell me if South Australia would be better served if there was more than one Agricultural College in the State? For instance, supposing one was established at Gumeracha, where there was a rainfall of 30 or 40 inches a year. I think it necessary to have two Government farms to thoroughly test the capabilities and requirements of the land. The greatest difficulty in connection with farming is to know the kind and quantity of manure to put on different lands. We are by experience finding this out, but at the same time it would be a great advantage to South Australia if we had an experimental farm in the hills district.

A Delegate—What about the north? We experience the same difficulty there.

Professor Towar—It is a very poor business policy, and in effect not very successful to have Agricultural Colleges established in out-of-the-way places. This had been the experience in America. Perhaps a little experimental station will answer the purpose. I cannot advise the establishment of more Agricultural Colleges at present, but possibly a few small experimental plots might be scattered about the State with a view to growing crops under different conditions and in different soils. This might result in some very wholesome experience. This was one of the methods adopted in America to ascertain if a particular district was adapted to the growing of rice.

Mr. Cornish—For years various experiments have been carried out at Roseworthy, but sufficient publicity has not been given to the conditions under which the results have been secured. These particulars, together with analyses of the soils, should be published, so that farmers can make comparisons with their own conditions.

A Delegate—Would the Professor tell the Congress what class of horses he would recommend for farm work?

Professor Towar—I should say all kinds. It is difficult to say definitely, because some horses, although of the same type, are not so good as others. Our American farmers use what is called the general purposes horse. He is an all-round, active animal, and fills a good many more places than the heavier draught horse.

The Hon. L. O'Loughlin—I am sure you will all agree with me that the Professor has given a very lucid and interesting lecture, and when you consider the short time he has had to form his impressions of our agricultural methods we must all agree that he has answered the questions very intelligently and readily. I believe we have done the right thing in going over to America for our new Principal of Agriculture. He has shown us that he is a good man, and that he can teach us something. We will all go away with the feeling that we have learned something from the lecture this evening. As the Professor becomes more acquainted with the farmers I think they will learn his worth, and I ask you to join with me in giving him a hearty vote of thanks. We wish him a prosperous and happy time in the State.

The motion was carried with acclamation.

Professor Towar—I thank you heartily. Ever since I landed in the State I have been treated in a most hospitable manner, and I feel at home already. In fact, I feel that I am now a naturalised South Australian.

Presentation to Mr. Molineux.

Mr. F. W. H. W. Krichauff—To-night we have met to do honour to one who, as a pioneer, has done a wonderful amount of useful work on behalf of the agriculturists of this State. I refer to the late Secretary of the Central Agricultural Bureau, Mr. Molineux. As you all know, at the end of the present month he officially retires from his position in the Civil Service, and we have met to mark the occasion by offering him some recognition of his work. Mr. Molineux was one of the first agriculturists in the State to advocate the use of artificial manures, holding the opinion that you should put into the soil what you took out of it, and thus maintain its fertility and productiveness. So far as I recollect Mr. Molineux never advocated the burning of the stubble. He has been one of those who have pushed forward the claims for co-operation in dairy work, and he has always advocated the conservation of fodder, of water, and of forests. In fact, right through he has been a perfect agricultural encyclopoedia. Like myself, he has found that old age is creeping on him, and that to a certain extent he must retire from the activities of daily work. The testimonial which I have been asked to present him with this evening is a unique one, and I am sure he will value it and the sentiments contained in it. I will ask Mr. Summers to read you the text of the address, which is signed by the Minister of Agriculture, the Hon. R. Butler.

It was as follows:—"We, the members and officers of the Agricultural Bureau of South Australia, cannot allow you to sever your official connection with us without placing on record our appreciation of the valuable services rendered by you to the producers of South Australia. For over 30 years you have been actively engaged in the dissemination of information concerning agriculture, and your services have always been at the disposal of those seeking knowledge in this direction. As the originator of the Agricultural Bureau, and as Secretary of that institution from 1889 to 1902, you have rendered most valuable service to the State, and in this connection your name will be remembered with feelings of respect for very many years. Most of us can bear personal testimony to the very wide range of knowledge you possess, and also to your readiness and ability to impart such knowledge to all whom it may benefit. Your work for five years as editor of The Journal of Agriculture is further evidence of your ability and qualifications for the position you have so ably filled. We all regret the circumstances which led to your resignation, and sincerely trust that you may long enjoy good health, and that your declining years may be prosperous and happy." On another page was printed the following:—"We, the members of the late Central Agricultural Bureau and the officers of the department who have been associated with you and your work, desire to express our regret that circumstances have rendered necessary the breaking of old associations. We are sure you must feel a considerable amount of satisfaction when you look back on the time spent in connection with the Agricultural Bureau, and the results of your labours, which are to be seen in many directions." In addition, the album contained the signatures of the members of 104 branches of the Bureau, each subscribing to the sentiments of the address.

Mr. F. E. H. W. Krichauff—I am sure that no man will be prouder of it than Mr. Molineux himself. There is no doubt that the Central Bureau has done good work, and I feel sure that the Council in the future will do even greater service on behalf of the State and agriculturists in particular. The newer methods should bring the industry more to the front. I heartily support what is contained in the address, and I wish health and prosperity to Mr. Molineux.

The announcement was received with cheers.

Mr. Molineux, in reply, said—I cannot say I have been taken by surprise because somebody let the cat out of the bag a fortnight ago. I don't mind admitting to the members that I would have been somewhat surprised if my work in connection with the agricultural industry had not been recognised in some measure. I have worked hard and earnestly on behalf of the farmers in the State, and I have tried in every possible way to advance and promote the work. The Ministry have seen fit to do away with the Central Agricultural Bureau, together with other bodies, and I suppose what they have done has been with the object of securing greater efficiency at a reduced cost. I do not blame them for endeavouring to save money, but I do think that the Central Bureau members have not received fair play altogether. We have been hindered in our work all the way through, but not so much by this Government. We have been told we must not spend money, and thus have been prevented, because of the cost, from doing good work. In consequence of this we have been very much dispirited. I am glad to see that the Minister is altering things to a considerable extent. I am extremely grateful to the meeting for this beautiful testimony of your appreciation of what I have done for the Bureau. The Minister stated last night that he would ask my friend, Mr. Krichauff, and myself to become life members of the new Council of Agriculture, and on my part I wish to say that the offer was made so handsomely I cannot refuse to comply with the request. When I asked Mr. Krichauff if he intended to accept the offer he said—"Of course I will; it would be wrong of me to do otherwise." So Mr. Krichauff and I are still to be connected with you, and I am sure we will do our best, with your assistance, to make the Bureau advance much more rapidly than in the past. Despite what Mr. Krichauff said about old age creeping upon me I still feel young yet. There were many and large sacrifices I made to take the position of General Secretary of the Central Agricultural Bureau, but I have been amply compensated by your appreciation of what I have done.

Thursday Morning, September 11.

The sittings of the Congress were resumed on Thursday at 9.30 a.m., when an officers' convention was held. Professor Perkins (Secretary for Agriculture), who presided, stated that to initiate the discussion he had asked Mr. Summers to prepare some suggestions for consideration.

Mr. W. L. Summers read the following paper on—

SUGGESTIONS FOR INCREASING THE USEFULNESS OF THE BUREAU.

This subject has received considerable attention of late at the Bureau meetings, but so far as can be seen, but little practical good has resulted. Having been connected with the Bureau for over ten years, and having the reports of the Bureau meetings to deal with, I am availing myself of the first Officers' Convention in connection with the Annual Congress to offer a few suggestions for increasing the usefulness of the Bureau.

MEETINGS.

Have regular days for meetings; do not postpone meetings unless really necessary. Appoint a good Chairman, who should see that the meetings are conducted in an orderly manner. He should keep the speaker to the subject under consideration, and see that this is finished with before a fresh subject is introduced. He should know the members thoroughly, and if a member remains silent in a discussion in which he is well qualified to take part, the Chairman should appeal to him personally.

DISCUSSIONS.

Have a regular programme of meetings drawn up. Choose subjects of a practical nature, suitable to the season. Let each member take some definite part in the programme. Avoid long and discursive papers; five minutes of short, concise remarks will cause more discussion and do more good than a paper which takes 30 minutes or more to read, and then leaves the members at a loss to know where to begin to criticise. Every farmer worthy of the name knows something that some other farmers will profit from knowing, but many good practical workers are afraid to trust themselves to writing papers. If they would simply jot down a few points to refresh their memories and speak at the meeting as if they were simply talking to friends, they will help their fellow members — only bear in mind, that the remarks should be short, so that the other members cannot shirk their share of the work with the excuse that "there is no time left for discussion." Every effort should be made to show the speaker that his efforts are appreciated, and two of the most effective ways of doing this are — (1) to listen attentively to what he says; and (2) to discuss and criticise his remarks when he has finished. Nothing is more trying to a speaker than inattention, and nothing less complimentary than absence of criticism.

MEMBERSHIP.

Every member should make a point of attending as regularly as possible. He should remember that the Bureau is a co-operative institution for the dissemination of information, and that the member who "takes" but is not prepared to "give" is quite out of place on the roll of any Branch. Those who recognise the responsibilities attached to membership of the Bureau will be an honour to the institution, and will be assisting the State to prosperity.

Encourage the young men to take part in the Bureau work; don't give them the impression that they are interlopers. Study their convenience in respect to time of meeting; don't fix on Saturday afternoon, as that is usually the only opportunity they have of recreation and healthy sport with their fellows. Give them a voice in the management of the Branch, and remember that it is quite possible for a man who has been farming for 40 years to learn something from an observant young man, who probably has had more opportunities for study.

VISITORS.

Every member should try to interest his neighbours in the work of the Branch. If the meetings are carried out as they should be, there will be less difficulty in securing the attendance of visitors than there has been in the past. Have a "special visitors' night" once a quarter or half-yearly, when every member should be bound to bring at least one visitor with him. The Chairman should take this opportunity to explain shortly the objects of the meetings, and extend a cordial invitation to the visitors to attend future meetings. Make these "visitors meetings" specially attractive; it might be sometimes possible to get an outsider to speak on some subject on which he is an authority, or the Department might be able to send one of its officers occasionally.

EXPERIMENTAL WORK.

This has not received the attention in the past that it should have had from the branches. True, thousands of packets of seeds have been distributed, but with what result? Hundreds of individual experiments have been undertaken by members, but how many have been comparatively useless through failure to keep proper records, and absence of definite plans. The system adopted in Canada with such beneficial results has been referred to on several occasions. We want something similar here. Experiments on a very small scale are a mistake; the results are likely to be misleading, and they involve too much labour. How many farmers have started the season with the intention of carrying out certain tests, and then found time did not permit of seeing them through? Experimental work involves a considerable amount of care and time, and requires to be carried out on systematic lines. Without some aid from the State it is not likely that much will be done. We have made a start this year, but the experiments are for want of funds confined to three points; where there are scores of series of experiments that the State would benefit from if properly carried out. How is the money to be obtained? Let me make a suggestion. At present we pay into revenue about £150 from sales, &c., of Journal of Agriculture. If we could increase this amount substantially, and get the Government to set it aside for experimental work under the supervision of the Department I think we would solve the difficulty. The subject, at any rate, is worthy of consideration.

"JOURNAL OF AGRICULTURE."

Discuss and criticise the Journal more; it would not be a bad plan to set a night aside occasionally for this purpose. Help to make the Journal more useful, and also to increase the revenue. Suggest where you think we can improve it. There are doubtless many points not dealt with that concern the readers. I am afraid too many members pay little attention to the Journals; at anyrate I know we often have an enquiry from a member about a matter only dealt with a month or two previously. File the Journals, and have them bound with the index each year. They will prove very valuable reference books on any farm.

BRANCH LIBRARIES.

It will not be possible to establish libraries of agricultural literature in connection with most branches, but something might be done through the local institutes which exist in most of the principal country townships. The committees of these institutes could probably be induced to obtain a few standard agricultural works if there was reasonable prospect of the same being availed of. If there was a genuine demand for such literature the Government might reasonably be asked to set apart a portion of the vote to country institutes specially for the purpose of such works. Unless, however, members and others would make use of such literature it would be better not to move in the matter.

Finally help the Hon. Secretary all you can; he has to do most of the work, and upon him much of the success of the branch depends. While giving him hearty support don't allow him to spoil the work through inattention to correspondence, meagre or delayed reports of meetings, &c.

Mr. Fisher (Tatiara)—We had found it beneficial to hold our meetings at different homesteads, at which experiments are carried out Saturday is generally the best day. The meetings of the Bureaux should not be postponed for events that are not of much importance.

Mr. Robertson (Wandearah)—I approve of having a fixed day for the meetings, and of members being notified.

Mr. Jorgensen (Mt. Remarkable)—I agree that a fixed day is best.

Mr. Cheriton (Strathalbyn)—If a Bureau has not a fixed day it is not worthy of being a Bureau.

Mr. Stephenson (Mallala)—I move that the suggestion made by Mr. Summers for a fixed day be approved.

Mr. Robertson—I second that.

Mr. Ricks (Cherry Gardens)—We have a fixed day, and consequently it is not necessary to send out notices. If notices are sent out members will rely on them and wait for them. In eight years we have not lost three meetings.

The motion was carried.

Mr Stott (Brinkworth)—I am very pleased with the paper. It is really a treat, for there is a lot of useful information in it.

Mr. S. J. Stuckey (Millicent)—The Millicent Bureau was one of the first established, and I was Secretary of it for many years, and was afterwards Chairman. I will move "That the discussions in Bureaux be by resolution." There are members that suffer from the same disease as many of our members of Parliament. The result is that there is a great waste of time. By moving a resolution you can take the sense of the meeting, whereas by open discussion you cannot. It is the sense of the meeting that we want. It is most essential to the proper conduct of the Bureaux that we should know whether we have a majority or not. I would not bar the Bureaux from discussing generally any matters after the ordinary business of the meeting is finished.

Mr. Hawke (Arthurton)- I second the motion. We always record our opinion as the opinion of our branch, and that is the most desirable way of getting some definite conclusion.

Mr. Ricks (Cherry Gardens)—I support that. The Secretary is expected to give the sense of the meeting, and he is often asked to convey to the General Secretary the opinion of the branch.

Mr. Brown (Port Elliot)—We arrange a programme for the year by taking a ballot of the members, and each member in his turn has to read a paper or initiate a discussion on some subject. We generally carry a resolution as to whether we are in favour of it or not, and there is no doubt that is the only way of carrying on the business.

Resolution carried.

Mr. Coleman (Saddleworth)—I propose that the second paragraph in the paper be adopted, and be recommended to the branches.

Mr. Frost (Saddleworth)—I second that.

Carried.

Mr. Bowie (Maitland)—I intend to move that an honorary membership be established in connection with the Bureau. Some members get tired in the work, not of it. They have done good service and are becoming aged. We want to retain the knowledge and experience of those members. The least we could do to them is to make them honorary members. By doing that we relieve them of the responsibility of attending the meetings unless they wished. The Bureau would be strengthened in many ways. I propose that a member must serve not less than five years, and that on attaining the age of 60 he should go on the honorary list.

Mr. Hawke (Arthurton)—We already have an honorary member, but he does not get The Journal.

Mr. Marshall (Eudunda)—I propose an amendment that the membership remain as at present. In my Bureau we have had several elderly gentlemen who have retired. Their sons have taken their places, but these gentlemen are ever welcome to our meetings. With the exception of voting they have equal power with us.

Mr. Edwards (Murray Bridge)—I think 15 members is quite sufficient.

Mr. Kennedy (Kadina)—I would suggest that any members over and above 15 be life members.

The motion was negatived.

Mr. Goode (Gladstone)—I move—"That the membership limit be abolished, and that branches be allowed to have as many members as they can obtain." We could then get a thoroughly live organisation and do more effective work. Opinions would be distributed better among the farming community. I was glad to hear Professor Towar say he would like to see an increase in the membership. I do not know on what grounds the present members want to shut out others. The question of expense is the only one that can be raised, and another resolution I will move will do away with that.

Professor Perkins—What is the resolution as to expense?

Mr. Goode—I would provide that members subscribe to The Journal of Agriculture, in which notification of meetings could be made. A programme of the meetings could be sent to members, and the present system of notifying by postcards, which is a big expense, could be abolished.

Mr. Smith (Wilson)—I second the motion.

Mr. McEwin (Brinkworth)—At some places you might get as many members as there are in this room, only one-third of whom are voting. It is not a question of expense. There is more in it than that. You generally get from the smallest number of men the best results. It is better to have 15 men who give proper attention to the Bureau work than 30 men, 15 of whom would always agree with the majority. The business is carried on better with the smaller number. I think we can oppose the motion.

Mr. Stone—I will oppose the motion. What we want is some alteration in our methods. One of the branches the other day passed a resolution that the older members should be called upon to retire. (A Delegate—An absurd suggestion.) It was a cruel suggestion.

Mr. Hughes (Woodside)—I oppose the motion. If we had an unlimited membership we would not get any results from the meeting. The decisions are little enough now. If there were 20 or 30 members we would want a lawyer in the chair and a shorthand writer. We would have rambling discussions and nothing definite would be brought forward. I would sooner see the membership reduced to 12, so that the members could come to the meetings and secure practical results. We should try experiments and urge the members to bring figures relative to their work. There should be good short papers and not long rambling discussions. That is where we could reform. The opinions should be disseminated through The Journal of Agriculture. I see no advantages, but serious disadvantages, from an unlimited membership.

Mr. Neill (Wilson)—If the older members do not retire how are you going to get the young men in as members with the present limit? I know a number of young men who wish to join the Bureau, but they cannot do so in many instances because the membership is full. I cannot agree with the suggestion to have an unlimited number, but I think the number might be raised to say 20. I move—"That the membership consist of 20 instead of 15 as at present." Expense will be saved if the motion is carried, and I think it supplies the happy medium.

A Delegate—A reform in our methods might well be made in giving outside people a chance to become members. We have members who will not attend and thus others are kept out. I am totally opposed to the motion. My suggestion is to make it more compulsory for the present members to attend the meetings. The member who did not attend six meetings out of 12 should be struck off the roll. At present it is sufficient if a member apologises at the third meeting if he has been absent from two meetings.

Mr. Matthews (Angaston)—I have been Secretary of our branch for a number of years, and I should like any of the delegates present to prove to me that the whole of the 15 members of any of the branches attend the meetings. I would not go in for an increase in the membership until it was shown that the average attendance was considerably higher; at present I do not suppose it averages more than nine or ten at a meeting. That means that about six members stay away, and that is the difficulty we want to overcome. The question of the alteration in the membership of the Bureaux has been brought forward before, and on that occasion the decision was decidedly against it, now we are discussing the matter again, and it does not seem that any good will arise from it.

Mr. Summers—This question of membership appears to me to be of the greatest importance. It is true that the young men are welcome as visitors, the fact remains that under the present conditions they do not attend as such. Mr. Stone characterises as cruel the suggestion that the old members should retire; it is more than cruel, it would be fatal to the Bureau if adopted. There is no question that if the Bureau is to do the work expected of it the younger men must be reached, but how are you going to reach them with the present limit. Again, there is the question of expense; to increase the membership by five extra in each branch would add £100 to the cost of The Journal, and unless, as Mr. Goode suggests, the branches contribute towards the expense, any considerable increase in membership is out of the question. A charge of this sort would certainly prevent the membership roll being encumbered with men who took little interest in the work, and would probably lead to more interest being taken in the Bureau.

Mr. Goode—If this motion is defeated it stops Mr. Summers's suggestion of increased experimental work altogether. It would almost appear that many members who are now in the Bureaux attend the meetings for what they can get. I think The Journal ought to be paid for, and I disagree with the suggestion that if this system were adopted a lot of the members would cease membership. Put yourselves in the position of the outsiders, the young men that cannot join the Bureau; the limited membership is a wrong principle. It is a question of right and wrong, and I hope members will look at it in that light. Those Bureaux who cannot get more than 15 members to attend, or perhaps 10, will not be affected by the motion if it is carried. It is the Bureaux who have the scope for a larger membership that I am aiming to deal with, and I think the result would be greater prosperity and increased usefulness for them.

A Delegate—I will support you if you will kindly make the membership 20 or 30.

Mr. Goode—No; I want the membership to be unlimited.

A Delegate—Then you will not pass the motion.

The motion was lost.

Mr. Murray (Stockport)—I think the members of a branch who missed three meetings should be struck off the roll, it would ensure more regular attendance. I move—"That those members who miss two successive meetings be struck off the roll, unless they offer a valid excuse."

Mr. McKenzie (Minlaton)—I move—"That one-third of the members of each branch retire annually."

The Chairman—That is a separate resolution.

Mr. Moore (Gumeracha)—I have the misfortune to live a considerable distance from the hall in which the meetings are held, and if I did not attend two meetings, my name would be struck off the roll.

A Delegate—You must send a valid excuse.

Mr. Moore—Some of us may be travelling in the country, and may not have opportunity to get word to the Chairman.

The Chairman—I think that would constitute a valid excuse.

Mr. Moore—But according to the wording of the motion if I am absent from two meetings in succession I forfeit my seat. The intention of the mover appears to be that if the member fails to attend two meetings without an apology his name should be struck off at the next meeting should he still be absent. Where we have to go a long way, a sudden change in the weather may prevent our attendance, and there would be no time to send any apology.

Mr. Kennedy—The difficulty would be if a member were travelling in the country, and has neglected to notify the Chairman.

The Chairman—Well, you could write.

Mr. Kennedy—I might neglect to do so.

The Chairman—Well, it serves you right.

The motion was carried.

Mr. Marshall (Eudunda)—I move "That the paragraph relative to visitors at Bureau meetings be passed."

Mr. Stone—I second that.

Mr. Marshall—I think the branch should adopt its own method of management.

The paragraph relative to visitors was passed.

The paragraph on experimental work was next discussed.

Dr. Ockley (Penola)—I wish to say a few words in reference to the method of distribution of seeds. A lot has been sent out to the branches in small packets, the packets have been distributed, but the work has not been carried out on any systematic arrangement, and as a result there has been no real benefit from this experimental work. My idea is that in all experimental work, the results of individual work should be made public. A member who has been given seeds should inform his colleagues as to what he has done. If that were done greater benefit would be attached to the work. At present I understand that with experiments with grass seeds only about a quarter of an acre is devoted to their growth. I think the area should be two or three acres, and then we would be able to tell whether the grass would do. I suggest that every member of a Bureau should conduct different experiments.

Mr. Marshall—In my branch for many years we have experimented with one piece of ground, and we have found this method advantageous. This year we have a piece of ground of extensive area, and we are experimenting with ten different kinds of manure for wheat crops. Records are kept, and progress is keenly watched, reports are preserved until the end of the year, and then sent to the Secretary of the Bureau. By this means the members of the Bureaux throughout the State are acquainted with the results. I move that the paragraph "Experimental work" be passed. There is one thing I should certainly like to see farmers experiment with. It is in connection with the influence of timber on the rainfall. I think there is a good deal in this theory.

A Delegate—Bunkum.

Mr. Marshall—That gentleman does not know what he is talking about. I think it is advisable that we in this country should understand this question. I know that in Egypt this experiment has been adopted with highly successful results, in Germany experiments are also conducted with success, and in Russia similar work is carried out. I think that if some vigorous planting were adopted some splendid results might be achieved.

Mr. Matthews—I second the motion.

The paragraph was passed.

Mr. Goode—I move "That The Journal be paid for at the rate of 2/6."

Mr. Matthews—I second the motion.

Mr. Robertson—I support the motion. I was going to propose that each member pay 2/ for the use of The Journal. We should have independence enough to subscribe to The Journal.

Mr. Campbell (Millicent)—I do not think it would be wise to charge for The Journal, but at the same time I have a high opinion of its value. I would sooner pay 10/ for it than lose it. In New South Wales and Victoria the Journals published there in connection with the Agricultural Department are supplied to the producer free, and I think it would be a bad policy to institute the payment system in South Australia.

The Chairman—Perhaps it would be a good idea to pay for The Journal conditionally upon the Government devoting the proceeds to the experimental work to be carried out by the branches. I am sure I could get the Government to agree to using the money in this way.

Mr. McEwin (Brinkworth)—I would like to point out that in some of the branches big individual cost occurs. I suppose my membership costs me two or three guineas a year, and I think the average cost to each member is about 6/.

Mr. Daniels—I oppose the motion because our branch spends a lot of time and money in the cause of agriculture. We pay more than The Journal is really worth.

Mr. Whittaker—I think it would be far better to leave the matter as it is at present. In our branch we have gone in for subscriptions, and it has caused a big individual expenditure. We are continually putting our hands in our pockets. The Government does not give us half that it ought to do. I admit that The Journal is valuable, but we ought certainly not to be charged for it.

The proposition that the members should pay 2/6 each towards The Journal was defeated.

Mr. Freeman—I move "That the paragraph 'Branch Libraries' be adopted as printed."

Mr. Marshall (Eudunda)—I second that.

Carried.

Mr. Whittaker—I move "That all the experts connected with the Agricultural Department be requested to annually visit the branch Bureaux." That is the only way to infuse and maintain life in the Bureaux. By that means we get opinions and information that we would not otherwise receive.

Mr. Stone—I second the resolution. If we are to receive the value of their services it will only be by their visiting the branch Bureaux as much as possible.

The motion was carried.

At this stage the Chairman of the Council of Agriculture (Mr. R. Caldwell) took the chair.

The Chairman—The Officers' Conference has been held, and suggestions for increasing the usefulness of the Bureaux made. It is now your business to confirm the resolutions.

Paragraphs 1 and 2 were confirmed.

The following resolutions were confirmed:—"That the meetings of the branch Bureaux be conducted by resolutions." "That the members absent for two consecutive meetings without a valid excuse be struck off the roll."

The paragraph "Visitors" was adopted.

The paragraph "Experimental Work" was next discussed.

Mr. Dall—I think that the great difficulty with reference to experiments arises from the fact that the results go no farther than the branch meetings. The reports, however short, should certainly be sent to the editor of The Journal for publication. I think we are losing a lot by working within ourselves rather too much.

The Chairman—I quite agree with the remarks. I think they are in full sympathy with the clause we are now considering.

Mr. Goode—The paper deals with the difficulty of carrying out experimental work. In order that it might be carried out more satisfactorily I move as suggested—"That a levy should be made of 2/6 per member, the proceeds to be devoted to experimental work." I think that method would bring in a good round sum.

Mr. Small (Kadina)—The Government ought to be far more liberal. A much larger amount should be provided by them in regard to experimental work. In the United States and Canada they do considerably more than our Government does.

A Delegate—They have more money.

Mr. Small—Well, I suppose there is something in that. The members of our Bureaux are always putting their hands in their pockets.

Mr. Coleman—I second the motion.

The Chairman—I take it that the amount will be handed into the general fund.

Mr. Myatt—I think it is quite sufficient if the members devote their time to the work of the Bureaux. They should not be asked to spend any more money.

Mr. Marshall (Eudunda)—Our branch has carried out experiments at a cost of £30, and we have made up the amount by a special levy. I do not think the members of our Bureau would agree to the motion in view of what they have already done and are doing.

Mr. Campbell—I do not think it would be wise to tie the members down to a levy as suggested.

The Chairman—Mr. Marshall has not stated what amount of profit his Bureau has received from the experiments they have conducted.

Mr. Marshall (Eudunda)—We have not received a shilling.

Mr. Goode—If a fund could be provided for experimental work it would be a grand idea. There is no doubt that more extensive work should be carried out, and it could be done so if the members do as I have suggested. If the motion is lost I do not think the Government would be prepared to sanction any large amount for the carrying out of experimental work.

Mr. McColl—Although the motion may be a good one, I think it is ill-timed in consequence of the drought. As it is the branches are put to a big expenditure, and it would be unfair to increase any financial liability. I think the branches should send in reports of the experiments carried out.

Mr. Campbell—I move as an amendment—"That the experiments carried out by the branches be reported to the editór of The Journal for publication."

Mr. Symons—I second the amendment.

The original motion was defeated, and the amendment carried.

Mr. Coleman—I move—"That the Government be asked to subscribe pound for pound raised by the branches for experimental work, conditionally on the outlay on the part of the Government not to exceed £200 per annum."

Mr. Matthews—I second the motion. There are branches that are not making experiments, and branches that are not subscribing freely to their funds, and there are members who wish to do so. I still submit that we are receiving more than we pay for.

A Delegate—No.

Mr. Matthews—You can hold to your opinion, and I will hold to my opinion. Our branch is not spending any money, and we do not make any levy. (A Delegate—Many branches do.) I would like the Secretaries to stand up and say what branches do pay.

A Delegate—In answer to that gentleman I would like to say that in many of the branches there is a general levy to meet the ordinary expenses.

Mr. Whittaker—Do I understand that the money raised as suggested by Mr. Coleman is to be spent in the districts which vote the money?

The Chairman—The money will be spent by the Department wherever they think fit.

Mr. McEwin (Brinkworth)—At Brinkworth we carry on a lot of experiments. If we get 3 lb. of wheat we give it all to one man.. He is allowed to cultivate it for three years, and has to give one-eighth of the product to the branch Bureau. The branch charges for the wheat 1/ over the market value, and a sinking fund is established. We also subscribe 5/ or 6/ yearly for other things.

The motion was lost.

The motion urging that experts should visit the branches was carried unanimously.

The Chairman—We have now endorsed the resolutions carried at the Officers' Conference, but we are willing to take in the form of a resolution any other matter dealing with the work of the Bureaux. I think it is desirable that the suggestions that have been made should be condensed into the form of resolutions. The spirit of them should be extracted and supplied to the different branches as working rules. My suggestion is that the Secretary of the Department should condense them—because they have all been endorsed—and dispatch them to the Bureaux as soon as possible, so that no time may be lost.

Mr. Jorgensen—I suggest that they should be printed in The Journal. By a show of hands the members approved of the Chairman's suggestion.

[To be concluded next month.]

AGRICULTURAL BUREAU REPORTS.

Stockport, September 16.

Present—Messrs. F. Watts (chair), D. G. Stribling, J. F. Godfree, T. Megaw, and J. Murray (Hon. Secretary).

Oiling Harness.—Referring to discussion at previous meeting on this subject, Mr. Megaw stated that he had been informed that a very good mixture for oiling the harness could be made of castor oil, mutton fat, beeswax, and lamp black Melt the fat and wax together, with just enough lamp black to colour it, then stir in sufficient oil to make the mass of the desired consistency. The harness should be washed before this is applied.

Congress.—Delegates reported on proceedings of Congress.

Willunga, September 6.

Present—Messrs. Thomas Pengilly (chair), W. J. Blacker, M.P., J. A. Hughes, H. Richards, A. Slade, John Allen, W. J. Binney, James Valentine, Captain Atkinson, and E. M. Slade.

Officers.—Messrs. Thomas Pengilly, A. Slade, and E. M. Slade were elected Chairman, Vice-Chairman, and Hon. Secretary respectively.

Grass Manures.—On August 23 several members of the branch, in company with the Inspector of Fertilisers, visited Mr. Pengilly's farm, near Aldinga, to inspect results of experiments in the manuring of grass lands. These experiments are being carried out under the supervision of the Inspector of Fertilisers, and so far show in a remarkable degree the benefit derived from the application of fertilisers. Where the manure had been applied there was from three to five times as much grass, and that of much better colour, than on the unmanured plots. Full report on the plots will appear in next month's issue of "The Journal of Agriculture."

Manuring Wheat Crops.—Mr. Binney tabled five samples of wheat from fallowed land, all showing good, strong growth. Mr. Valentine tabled a sample of Gluyas wheat, grown after peas and manured with 1 cwt. per acre Adelaide Chemical Works bone super. The wheat was out in ear and over 4 ft. 6 in. high. Other varieties of wheat grown by Mr. Pengilly looked very promising.

Meadows, August 18.

Present—Messrs. J. Catt (chair). T. B. Brooks, G. Usher, T. Usher, G. Ellis, W. J. Tucker, J. Usher, and D. D. Murphy (Hon. Secretary).

Change of Seed.—Mr. Catt initiated a discussion on this subject. He mentioned that he had been told by a wheatgrower that he had grown wheat for 25 years without a change of seed. His practice was to screen the seed carefully, and throw out all that did not come up to his standard. The Hon. Secretary said this selection of the best seed for sowing was an instance of working on the lines of the "survival of the fittest." He also stated of the eight varieties of wheat received from the Agricultural Bureau this season only two lots had germinated, although they all received the same treatment, and were pickled in bluestone solution at rate of 1 oz. of bluestone to 8 gallons of water. [Samples of growth from four of the varieties that failed have been submitted by other members to the Department.—Ed.]

Oranges Deteriorating.—Mr. G. Usher stated that 25 years ago he planted some orange and lemon trees in his garden. These did well, and the oranges bore good fruit up to two years since, when they had a distinct lemon flavour. This year the fruits look and taste more like lemons than oranges. Members wanted to know whether it was possible for the fruits to have become innoculated from the lemons.

Tanunda, August 15.

Present—Messr. P. Trimmer (chair), F. W. Graetz, E. Schrapel, F. W. Grocke, and E. L. H. Heinemann (Hon. Secretary).

Native Birds.—Discussion took place on the destruction of our native birds, and a resolution was carried favouring the more stringent measures being enforced in order to protect our insectivorous birds.

Peach Aphis.—Several members mentioned that they had been successful in dealing with peach aphis by means of sticky bandages. They used oilcloth, placing the oiled side against the tree, and applied tar to the outside; when the tar dried a fresh coating was given. This method prevented the insects from crawling up the tree, the bandage being placed below the first branches.

Minlaton, September 6

Present- Messrs. J. Martin (chair), J. D. Mayer, J. Anderson, W. Harmer, S. Vanstone, E. Correll, W. Martin. J. Bennett, T. Brown, and J. McKenzie (Hon. Secretary).

Woolclassing.—Mr. Correll suggested that the branch should arrange for the formation of a class in woolclassing under the supervision of Mr. G. Jeffrey. Stansbury Branch was doing this, and if they took up the matter Mr. Jeffrey would be able to help them also. Most members agreed with the suggestion, but thought that with small farmers only growing two or three bales of wool classing was out of the question, as it would make too many small packages.

Baconcuring.—Mr. Correll tabled a side of bacon cured by himself. It was very attractive in appearance, and quite free from excess of salt; it had been pickled in brine.

Wheat Experiments.—The Hon. Secretary reported that the rust-resisting wheats received from the Department looked fairly well, but needed more rain. He would ask members to pay a visit to the plots later on.

Making Farm Life Attractive.- Mr. Vanstone read the following paper on "How to Make Farm Life Attractive to our Women and Girls":—

This paper is more or less supplementary to the one read by Mr. McKenzie at our branch a few months ago. That so much has been said, and written, on this subject, proves that farm life under present conditions is not as attractive as could be desired for either sex, and perhaps of the two, the women have in many cases most cause of complaint. We are frequently told that farm work, such as milking, churning, and feeding cows, pigs, and calves, is drudgery. That in the town the shop and factory girls have shorter hours of labour, and more time for recreation and amusement. So that when boiled down the whole matter appears to be—that less work and more pleasure is what is wanted. Now, I am aware that some already have every convenience which any one could reasonably ask for, yet there may be some of us who up to the present time have not given the matter much thought. I wish, therefore, just to mention a few things which in my opinion tend to lighten farm labour. In the first place it occurs to me that where dairying is carried on by the women, it is much better to have a dry shed for milking in, than a muddy yard. Also that it will be much pleasanter for the milkers, as well as more profitable for the owners, if a good feed is provided for each cow, at least once a day. This will save all the trouble of bringing the cows in, as they will always be on hand when feeding time comes, and another thing is it will pay to do it. As we have recently had a paper setting forth the advantages of using a cream separator, I will not further allude to it here. A good supply of wholesome water for household purposes should also be provided; where the water is provided frequently it is very difficult to obtain it, owing to the pump being out of order, or some such cause; the result being more work. A stack of firewood cut in suitable lengths, will also be found much better than having a few tough old logs simply marking the place where the woodheap ought to be. A Metters or Giffhorn stove is also a great advantage, and considerably lightens the labour of cooking, and if properly set, will not be found more expensive in the end than the old fashioned oven.

Then for the pleasure part. If, as is most frequently the case, one or more of the girls are musically inclined, an instrument (piano or organ) in the home will afford both them and yourself much enjoyment. Allow them to invite their young friends occasionally, and there will be evenings spent that will be anticipated and remembered with pleasure. A flower garden, however small, or failing that a flower house, can be made and need not cost anything more than a little labour, and the time will be well spent. Another suggestion I would make is this. As far as possible divide the labour. Let each one have her own duties for which she alone is responsible, and give each one an interest in the profits of her particular work. For instance, if one or two have dairy work to do, give them a percentage on all butter sold. If this plan is adopted, I would not give much for the strippings that will be left in the udders after milking is over. Then let one have charge of the poultry, and give her the privilege of raising a certain number each year, or allow her say 5 per cent. of the eggs to sell for herself. If you do this, you will find her sight keener than that of the most cunning crow that ever stole an egg. I believe that by paying a little more attention to such matters as I have mentioned our girls would be more contented, and they would have no wish to exchange farm work for any other kind of labour.

Nantawarra, September 16.

Present—Messrs. Jas. Nicholls (chair), R. Nicholls, T. Dixon, jr., G. Belling, E. J. Herbert, A. F. Herbert, S. Sleep, and H. J. Spencer (Hon. Secretary).

Congress.—Mr. Sleep reported on proceedings of Annual Congress. Some discussion took place on Mr. Trengove's paper on the use of the binder and header. Mr. R. Nicholls stated that last year he was cutting a rusty crop with the binder for hay, but running short of string he left a few acres which he stripped. The grain secured by the stripper was unmarketable, while the grain in the sheaves now is fairly plump, and much superior to the stripped wheat. Members considered that the difference between the weight of the grain from the bound crop and that from the stripped, as given in Mr. Trengove's paper, viz., 68 lb. and 58 lb respectively, was excessive.

Stock Complaint.—Mr. R. Nicholls reported loss of four young cattle under two years old, and one milking cow, all within two days. The animals were apparently in good condition, but get stiff, the tongue seems swollen, they foam at the mouth, the jaws moving as though chewing the cud. On being opened a part of the intestines appeared inflamed, and it was suggested that death was caused by poisonous weeds. Mr. E. J. Herbert asked whether rabbits poisoned in the ordinary way would retain enough poison in the bones or body to affect cattle that might eat them as they so often do. [The cattle, in the opinion of Mr. Valentine, show in a marked manner the symptoms of acute digestive troubles. Poisoned rabbits, especially those dying from the effects of phosphorus, are dangerous to stock, and numbers of cattle have died after eating the bodies of poisoned rabbits.—Ed.]

Eudunda, September 15.

Present—Messrs. J. von Bertouch (chair), R. Kluske, E. T. Pfitzner,. H. Martin, H. Wiel, W. F. Krummel, F. W. Paech, and W. H. Marshall (Hon. Secretary).

Congress.—The Chairman and Hon. Secretary reported on proceedings of the Annual Congress, and generally expressed approval of the results of the voting on the resolutions at the officers' conference.

Experimental Work.—The Hon. Secretary suggested as a valuable experiment the cultivation of saltbush and bluebush. If a piece of Government land nearer Goyder's rainfall line could be secured for the purpose he thought the branch would do well to take up the matter. Members approved of the suggestion, and it was decided to approach the Department on the matter. Mr. Kluske reported that the crops manured with fertilisers supplied by the Department were coming on nicely. Up to the present the Thomas' phosphate was not so forward as the other, the mineral super. being the best so far.

Sale of Eggs by Weight.—Mr. Weil tabled sample of eggs sent in for sale. The eggs were unusually small, and irregular in size, and afforded a splendid object lesson in favour of eggs being sold by weight instead of by number.

Bute, August 19.

Present—Messrs. J. H. Brideson (chair), J. H. Barnes, A. Schroeter, H. Schroeter, E. Ebsary, R. Commons, W. H. Hamdorf, S. Trengrove, M. Stevens, and W. H. Sharman.

Takeall and Fallowing.—Mr. Brideson asked whether they were more likely to get takeall where the stubble was ploughed in than where it was burnt off before ploughing. Mr. Ebsary thought takeall more prevalent where stubble was ploughed under; his experience also showed that it was more prevalent on land fallowed dry than on winter fallow. A long discussion took place on different ways of working the fallow. [Was there nothing worth reporting for the information of members of other branches?—Ed.]

Holder, August 23.

Present—Messrs. J. Rowe (chair), W. J. Green, J. Jones, H. Vaughan, F. Starr, E. Jaeschke, S. Pickering, W. J. Wood, F. Rogers, J. Rossiter, C. H. Perry, J. J. Odgers (Hon. Secretary), S. McIntosh, and two visitors.

Grading and Packing Fruit.—Mr. S. McIntosh, Inspector of Village Settlements, gave an interesting account of the Dried Fruit Trusts of Renmark and Mildura. He explained the different grades adopted, the processes of drying, and the requirements of the different sections. The necessity for uniformity and regularity in grading and packing was referred to, and he urged the establishment of a proper union to do this work. A long discussion took place, and it was resolved that the Hon. Secretary obtain all the information possible, and then call a meeting of those interested to consider the question of forming a union.

Brinkworth, August 15.

Present—Messrs. A. L. McEwin (chair), J. F. Everett, A. W. Morrison, J. Cross, W. H. Shepherd, A. Jericho, J. Stott (Hon. Secretary), and one visitor.

Cost of Wheatgrowing.—The Chairman furnished following estimate of cost of working a 1,000-acre farm, and the income from same:—

COST.				INCOME.			
Rent, 2/6 per acre	£125	0	0	12 Bushels per acre of 300 acres, 3,600 bushels	£450	0	0
Rates and Taxes	5	0	0	Profits 150 Sheep	30	0	0
Wages, two men, £75 each ..	150	0	0	Profits from Cows	25	0	0
Manure, 12 tons	60	0	0	Profits from Fowls	15	0	0
Hay for Horsefeed, 50 tons ..	75	0	0				
10 per cent. depreciation on £600, value Implements, Horse Stock, &c.	60	0	0				
Blacksmith Repairs	10	0	0				
Saddle and Harness Maker ..	10	0	0				
300 Bushels Seed at 2/6	37	10	0				
	£532	10	0		£520	0	0

The above is a fair estimate of expenses incurred on a farm of the kind that can be got at the rental, and the returns a fair average for that class of land. These figures prove that wheatgrowing will not pay at 2/6 per bushel, and this has been abundantly demonstrated where persons have been renting the land. Hence the reason for farmers' sons drifting away to the city and other spheres of employment, as the family have to live out of the wages which should properly have gone to the sons for services rendered. Of course where a farmer owns the land he makes a decent living, but that is all. A difference of 1/ per bushel for the wheat would make all the difference between profit and loss. I would also draw attention to the fact that the two men's wages really includes the employer, who has to keep his family, if young, out of it; two men are ample to work a farm of the size mentioned, with the aid of an extra man for three weeks' winnowing The value of the hay is quoted in accordance with the value of wheat, a 12-bushel crop being equal to a ton crop of hay. In the income the whole area is shown as reaped. No allowance is made for cornsacks, which would add another £20 to the cost.

Johnsburg, August 16.

Present—Messrs. T. Potter (chair), F. W. Hombsch, J. R. Masters, L. Chalmers, M. L. Reid, J. Luckraft, P. Caughlan, W. McRitchie, W. Buchanan, and T. Johnson (Hon. Secretary).

Improvemnt of Live Stock.—Mr. Chalmers said it was very desirable that improved strains of pigs and poultry should be introduced to this district. He suggested that the delegates to the Annual Congress should be authorized to inspect such animals at Roseworthy and elsewhere, and enquire as to prices, &c. The delegates agreed to make enquiries on behalf of the members.

Storing Wheaten Chaff.—The Chairman read the following paper on this subject:—

In our dry district, where hay is rarely grown to any extent, cocky chaff is what we have to depend upon, mixed with grain, or meal, as our chief fodder. Therefore it behoves us as farmers to keep it in as good condition as possible by carting it in early from the field before it is damaged by the weather, and housing it in the best possible way. The ordinary way is to heap it in a yard handy for use, and cover it with straw. To this practice there are many objections; it is wasteful, and the chaff gets fouled and stale. When we consider its value and the distance it has been carted to this district in times of scarcity—in some cases more than a hundred miles—we as farmers should make better provision for its storage. It being of a bulky nature it requires a large space with plenty of room for wagon to unload readily. A very good enclosure can be made for the purpose on any farm at little expense or labour in the following manner:—Put in a double row of posts 2 ft. 6 in. apart and 8 ft. high, with seven wires, each 1 ft. apart, to form an oblong enclosure, not more than six yards wide in the clear, but of any length desired. Straw firmly trodden in between the rows of post and wires makes a good wall 8 ft. high. One end should be left open for wagon to back in to unload and close at the finish: a small door for taking out chaff as required is needful. When carting in chaff tread down firmly as you proceed. When walls are full roof up as in building any other stack, treading well to the finish. Cover with straw 18 in. thick and secure it from blowing away, and your chaff is safe for a long time. I have an enclosure 6 yds. by 16 yds. in clear built in this way; it has been in use two years, filled twice, and it answers the purpose splendidly. It is built on one side of my horse yard, and gives good shelter. Similar enclosures could be erected in paddocks far away from the homestead for convenience of carting in chaff and feeding stock, and would act as a breakwind for them; by thatching it could be kept for years of scarcity. If stored early in this way it retains its fragrance and stock relish it.

Considerable discussion ensued. Members spoke very favourably of Mr. Potter's method of saving cocky chaff; most of them had already noticed the chaff stack, and had decided to follow Mr. Potter's example in the future.

Colton, September 6.

Present—Messrs. W. J. Packer (chair), E. H. Whitehead, W. A. Barnes, H. A. Kleeman, and R. Hull (Hon. Secretary).

Lice on Horses.—Mr. Barnes asked for cure for this complaint. Tobacco water and sheep dip were recommended.

Destruction of Rabbits.—Mr. Packer read a paper on this subject to the following effect:—

The question of rabbit destruction is of the utmost importance to farmers on the West Coast, and while they all recognised that they could not be completely exterminated there was no doubt much more could be done to lessen the damages than has been done. Unfortunately for the farmers, the rabbits were allowed to breed practically untroubled in the large pastoral areas north of the district. The holders of these blocks say that it will not pay to destroy the rabbits, but as in other districts pastoralists are compelled to attend to this work, steps should be taken by the authorities to enforce the law here. The rabbits breed and increase rapidly in these areas, and when the grass begins to dry up and feed gets scarce they migrate to the coast, devouring all green stuff they can find. This usually occurs about November, but last year they swarmed down on the crops about October, and did as much damage as a plague of locusts. His suggestions for dealing with the trouble were—(1) The local council to levy a rate for vermin destruction, and spend the money in systematic efforts to deal with the pest; (2) That the council buy and mix poisons that have proved effective in the destruction of rabbits; (3) That two competent men be employed to take charge of the work, and an automatic poison distributor be procured from Sydney or elsewhere; (4) That during October these men commence the distribution of poisoned baits on the outer boundary of the council under such conditions as may be considered best, and that the men gradually work in towards the settled areas as the rabbits come in, finally finishing up about August. This would give much better results than if they waited until the rabbits reached the farming lands. He was aware many would say they were taxed quite enough already, but they must remember they would receive a direct benefit from such a tax. The proper carrying out of a scheme such as that suggested would relieve the farmer of much of the trouble and expense of dealing with the migratory rabbits. One farmer told him that it cost him £25 a year to deal with the rabbits, and still his land was not clear. Others were in the same position, and were likely to be until some effective means were adopted of dealing with the rabbits on the outside areas. In his own case they had done practically nothing but kill rabbits for six weeks at a time, and this after those breeding on the land had been so thinned down previously that it had been difficult to find one on the place. He was sure it would pay them better to contribute in the way suggested, and save expense and time, which should be devoted to preparing the ground for the next crop. There was another point worth considering, and that was the prevalence of wild dogs, which were a source of considerable loss and expense to both farmers and squatters. In his opinion one cause of the great increase of dogs was the prevalence of rabbits. The sluts had no difficulty whatever in finding sufficient food for as many as six pups in a litter. If their food was not so plentiful fewer pups would come to maturity.

Mr. Barnes thought it would be profitable to him to contribute £25 per annum if he could secure thereby the destruction of the rabbits on his land. The Hon. Secretary was sure Mr. Barnes could not do the work himself for the sum stated. The question of rabbit destruction was a difficult one to deal with, but there was no doubt that united and systematic action as suggested by Mr. Packer would do a lot of good.

Scales Bay, August 30.

Present—Messrs. J. J. Roberts (chair), A. Plush, A. Newbold, W. J. Thomas, D. P. Thomas (Hon. Secretary), and four visitors.

Wire-Netting Fences.—Members reported that they had noticed in this district that while in some places the netting had rusted right through, where put in the ground, in other parts on the same line of fence it was in better condition below ground than above. Tarring the netting before erection was advocated: the average life of wire netting on the coast districts was stated to be only about 10 years. Members stated that as a rule the netting sold now was not equal in quality to that formerly obtained, and attributed the depreciation to competition in the trade. They strongly advocated closer examination as to weight and condition before purchasing.

Meadows, September 15.

Present—Messrs. W. Pearson (chair), G. Usher, J. Catt, T. B. Brooks, A. Stevens, and D. D. Murphy (Hon. Secretary).

Fruitgrowing.—Discussion on this subject took place. It was generally agreed that the district was too cold for the profitable cultivation of the orange. The renovation of old fruit trees was discussed. Heading back the top, and taking out a trench round the tree and pruning the large roots, including the taproot where possible, was stated to be very successful.

Mangolds.—Mr. Pearson stated that from one row of mammoth yellow mangold he got as much weight of roots as from six rows of equal length of tongued. The latter variety seemed to have become crossed with beets. When feeding to cows in winter it was advisable to give dry feed with mangolds. Mr. Stevens had given chaffed peastraw with mangolds. Mr. Ellis stated that he feeds his breeding sows on mangolds, and rarely uses pollard.

Elbow Hill, August 15.

Present—Messrs. S. Pike (chair), J. Ward, W. Spence, J. Harvey, J. Wake, G. Dunn (Hon. Secretary), and seven visitors.

Annual Report.—The Hon. Secretary's report showed that nine meetings had been held during the year, with an average attendance of seven members. He regretted the members were not more regular in their attendance: it was not much to expect them to give one evening a month to an organisation from which they derived so much benefit. The system adopted of drawing for names of members to read papers had proved successful. Eight practical papers had been read and discussed, and he was pleased to say that in no case had the member to whom had fallen the lot of preparing a paper shirked his duty. Visitors have averaged four each meeting. During the year the branch had purchased a Jersey bull, and those who went in for dairying should be benefited by this action. Mr. T. J. Brooks was elected Chairman, and Mr. Dunn was re-elected Hon. Secretary. Three names were removed from the roll of members, and others nominated in their places.

Profitable Farming.—Mr. Wake read a paper on "Do We Cultivate Land at a Profit?" which was well discussed. Harrowing the land after fallowing was not favoured by several members, who preferred to leave the ground rough until the weeds start and then harrow. Those who have fallowed new land reported that they got double the crop as compared with the same class of soil not fallowed.

Wilmington, September 15.

Present—Messrs. W. Slee (chair), J. McLeod, M. Bischoff, P. L. Sullivan, J. Lauterbach, J. L. Broadbent, J. Schuppan, A. Maslin, F. Bauer, R. G. S. Payne (Hon. Secretary), and one visitor.

Iron Posts for Fencing.—Minutes of previous meeting gave rise for further discussion on this subject. Mr. Bischoff stated that he had a machine that punched the holes for the wires very cheaply. In reply to question, Mr. Slee stated that after using iron posts he would not now use wooden ones: the iron posts in his locality were cheaper, and more durable, and were not affected by fire.

Destruction of Locusts.—The question of combatting the locusts with arsenical poisons was discussed, but members were not in possession of information as to quantity of poison to use, and the best method of distribution, to discuss the matter fully.

Congress.—Mr. Maslin reported on proceedings of Annual Congress, and commented favourably on the orderly character of the meetings. He also tabled printed copies of the papers read at the Congress, and the Hon. Secretary suggested that instead of these papers being relegated to the past, they should be taken up and criticised at the ordinary meetings of the branch. Members considered the suggestion a capital one, and it was adopted, a programme for the next seven meetings being drawn up, a different member undertaking to initiate the discussion on each paper.

Beekeeping.—Mr. Broadbent read a paper on this subject to the following effect:—

Bees should be kept more generally, because they are profitable; no branch of rural industry can show so large a percentage of return on the labour and capital involved. As a young fellow on a farm I kept bees and earned my pocket-money from them. My bees were, in fact, a very profitable source of income. Beekeeping, as a specialty, was not advocated, though some make it pay, but it should be carried on in conjunction with farming, gardening, and similar occupations. Even the merchant or professional man or labourer can, by means of bees, provide a luxury for his table, and perhaps add to his income. As most of them knew, the bees in every hive were either queens, workers, or drones. The queen is the mother of the hive, and, after mating, has the power of controlling the sex of her progeny; that is, she can, at will, lay eggs that will produce either female or drone bees. The workers are imperfect females, and the eggs which produce them will, under special treatment, produce perfect females or queens. The queen never leaves the hive except to mate with a drone when a few days old, and when she leaves with the bees at swarming, the imperfect females or workers gather the honey, clean the hive, feed the young bees, provide for the queen, and defend the home, as many of us know to our cost. Of the drones perhaps the less said the better; in the hive they are necessary, but they exist in other places. Some, in fact, may be found in the Bureaux. The wax is an animal secretion in the bee, and, as it is estimated that a bee will consume 20 lb. to 30 lb. of honey in making 1 lb. of wax, it is of the utmost importance that all good pieces of comb should be utilized by the beekeeper. The day has long gone by when bees were kept in any old boxes or even hollow logs. With the bar-frame hive of the present day the beekeeper can utilize the bees' services to the best advantage, regulate swarming, and also inspect them at work when desired. Ample room should be provided in the hives; all hives should be double-storied. The bees naturally store the best honey near the top, and, in the gathering season the pure article, unmixed with bee-bread, will be stored in the upper hive. These upper stories should not be put on, however, until the fruit blossoms become plentiful. Early in spring they are of no use; in fact, many people fail with their bees owing to giving them too much space in the cold weather, the consequence being that, owing to the loss of heat during the brooding season, there is much mortality, and the colony becomes weak; in a poor season starvation may result from this mistake. When the bees commence storing honey in the upper box they should be carefully watched and the frames removed when full, new frames being put in to keep the bees busy. The great secret of success in beekeeping is to keep the colonies strong, and this leads up to the question of swarming. In early spring numbers of bees are reared until the hive is crowded with workers, then the drones, and last of all, the queen cells are built. During this breeding season I always cut away a lot of drone comb—which is larger in the cell than the worker comb—in order to avoid having too many of these loafers in the hive when the queen cells are capped over. Some fine day the old queen and part of the bees leave for a new home. The hive is left full of brood, which is hourly hatching, and soon bees are as numerous as ever. A young queen hatches about eight days after the old one leaves, and if permitted will kill all other embryo queens. If the bees wish to swarm again they prevent her doing this, and then a second and third, perhaps more swarms come out, led by young queens. There are many evils attending natural swarming. In many cases colonies become weak; in others swarms go away altogether. In frame hives swarming can be controlled to the wish of the apiarist. When drones appear colonies may be safely divided. Choose a time when honey is abundant in the surrounding district, and also when the nights are warm. To make a swarm get a hive the same size and pattern as your others. From four strong hives take two frames from each, containing eggs and drone brood, and place them in the new hive. Replace these with empty frames. Then move a hive which you have not hitherto disturbed a few yards to a new place, and place the new hive where that one stood. If this is done at midday some fine day the bees which are absent gathering honey will come back loaded to their old place, and find it strange, but as it contains stores, young bees hatching, and eggs they will at once rear a queen, and thus form a new colony. I never made a swarm or allowed swarming unless my colony was exceedingly strong, and frequently prevented swarming by cutting away all drone and queen cells. The bees soon tire of the intention of swarming, especially if plenty of room is given and the hive kept sweet.

Cabbage Seed.—Mr. Schuppan asked for information as to best way to save good cabbage seed. Members would be glad of information on this point.

Naracoorte, August 16.

Present—Messrs. S. Schinckel (chair), J. Wynes, J. G. Foster, G. Wardle, H. Buck, W. McKay, J. B. Bennett, F. Welcome, A. Caldwell, E. R. Peake, W. A. Terry (Hon. Secretary), and one visitor.

Ploughs and Ploughing.—Discussion took place on paper read at previous meeting by Mr. Buck. Mr. Forster commented favourably on Howard's and Hornsby's ploughs; it was scarcely correct to describe double-furrow ploughs as comparatively new when they had been in use for over 30 years. Mr. Bennett considered that the work of a plough depended mostly on the man using it. What was a good plough to one man was a bad plough to another. No hard and fast rules for ploughing could be laid down, as everything depended on the soil. Different kinds of ploughs were required for different soils. The Chairman agreed with Mr. Bennett. The Hornsby plough was very good for most soils, but was useless on sticky soil. Mr. Buck said he referred in his paper more to ploughs for these sticky soils; the stump-jump principle on all ploughs would be an advantage.

Utilization of Land.—Mr. Foster read a paper dealing with the best way to divide up the Naracoorte Estate, which has been purchased by the Government for closer settlement purposes. There were several different classes of soil, and these required to be dealt with differently. The cut grass and grey soil plain land was only suitable for grazing, and would carry one sheep to two acres, and should be cut up into 500-acre blocks, with some of the higher lands on which fodder for dairy cows could be grown. The plain land with black soil and marl or gravel mixed with clay bottom has outcrops of stone, and if cultivated stump-jump implements must be used. It will give fair crops of Algerian oats, but must be manured for wheat. It is, however, better suited for dairying, and should be cut up into blocks to include some of the higher land. The chocolate and black soils require little remark; they will not, however, produce more than three good crops of wheat, as the land soon gets very dirty. There was also red soil, with limestone bottom, suitable for cereals, fruit trees, and vines, and some sandy patches with ferns, which could be profitably cleared by means of pigs, and utilized for wattles or for fodder crops. Discussion took place on "wheat sickness" of the black and chocolate soils. Rotation of crops and use of manures were suggested as remedies.

Yankalilla, September 5.

Present—Messrs. E. C. Kelly (chair), G. Newbold, J. Tonkin, H. J. Denniss, R. Lovelock, Dr. Meikle, Messrs. H. J. Loverington, J. Crawford, G. H. MacMillan (Hon. Secretary), and two visitors.

Feeding Stock.—Mr. J. Crawford read the following paper on Grazing and Feeding of Stock:—

There was philosophy in the lament of the old lady sitting on a steamer's deck. 'Water, water everywhere, but not a drop to drink." Man or beast, with impaired digestion, may die in the midst of food. I have seen animals, sleek and fat, suddenly pine and die, though running in abundance of feed of a kind. These instances were in the region of drought, where dry food alone existed. On this same food stock brought from where rain had fallen throve. The same influence is at work here. While the native grasses flourished such a thing was unknown. By continuous stocking (even without cultivation) the land loses the best of its native pastures, and in their stead inferior grasses and weeds gradually assume possession of the soil. When first country is stocked for a certain period—longer or shorter, according to the nature of the land and rainfall—pastures improve owing to the firming of the surface. Nutrition is not increased, but the carrying capacity is, without doubt, improved. When that stage is reached there is no standing still. Every bushel of grain, every pound of beef and mutton, every ounce of dairy produce, removes constituents from the soil, which, if not replaced, will ultimately impoverish the soil to such an extent that less produce and of inferior quality will be raised. This retrogression is swift and short on inferior country; it is slower, but as certain with fertile soils The lesson has been taught more emphatically in relation to cereal productions, but it is none the less true with respect to grazing. On new country stock thrives almost equally well on dry as on green feed. In this district now, as soon as herbage and grass become dry, they are of little value as fodders; only the seeds licked up from the ground contain nutriment, the bulk is useless. With our soil and rainfall I maintain it will pay to destroy these useless cumberers of the ground (where the land is arable) and plant good pasture grasses; grasses that stock will eat from root to head. A twenty-bushel crop is supposed to equal two tons hay. Reap the half, feed the grain to stock, and destroy the straw; convert the other half into hay. In the former case you have 1,200 ℔., in the latter 4,480 ℔. of food. Allowing for the strength of the former you can still feed three times the number on the latter. Grow grasses that stock will eat in bulk, and the carrying capacity of the country will be doubled or trebled. Had stocking been intelligently conducted from the start and intelligently continued, the pastures would not now be so inferior as thy are. Take two pieces of country equal in area and carrying capacity. The occupier of one block will carry double the stock his neighbour has, and still be lighter stocked. The former has his land divided intelligently, is continually moving his beasts from paddock to paddock—experience and observations have taught him when. The latter does not judicially divide, brings little observation, little experience to bear; allows animal instinct, instead of human intelligence, to bear sway. The former will usually have a credit at his bank; the latter usually a debit in his merchant's books. A week's spell at the right time will often double the carrying capacity of a paddock for months Six months' spell at the wrong time does no good. In bush country spelling or light stocking can be done at any time of the year after a fall of rain. With grass country the most important time is just when grasses are running to seed. No grass paddock should be stocked at this period so heavily as to prevent seeds maturing. In years gone by cows would give profitable returns for nine months out of twelve. Now, on the same land, on account of deterioration of pasture, the same beasts will only be profitable three months and unprofitable for nine. To dairy profitably, cows must now be more or less artificially fed nine months out of twelve. Where, by reason of irrigation, green crops can be grown, dairying can be most profitably undertaken. These cases are few, and we are therefore compelled to fall back on purchased foods. If you wish to feed for beef use grain, oats, or wheat, crushed and mixed with chaff; if for milk, copra and bran alternately, each and both mixed with chaff. Will it pay? Yes and no. Much depends upon the person directing, much upon the cattle fed. It is a common fallacy that a hard-working persevering man will ultimately succeed. Brain power and expert knowledge must direct work and perseverance, or they will not achieve success. One will succeed where another will fail, both equally hard-working and persevering. Again, some cows you may feed till the crack of doom, and lose by them day by day; others you will make a profit out of year in and year out. If you are feeding for beef select for beef; if for milk choose milk-producing animals; such beasts it is almost impossible to overfeed, and it is unprofitable to be sparing in their fodder. If you let your beasts become living pictures of Pharoah's lean kine, the loss resulting will be no dream, but a stern and costly reality.

Swan Reach, September 20.

Present - Messrs. F. F. Brecht (chair), F. W. Hecker, D. Rowe, E. Micke, A. G. Zadow, P. A. Hasse, L. Fidge, R. J. Harris (Hon. Secretary), and three visitors.

Improvement by Selection. Mr. Hecker initiated a discussion on improvement of seed by selection. With wheat it was particularly important that the farmer should at harvest time select the best heads in the crop, and sow these separately to provide seedwheat. Unless the seed was carefully selected the best kinds will, in a few years, go back to the original stock. He had noticed the same with potatoes; if they are planted year after year without any attempt to select the best, both quality and yield soon depreciate. Mr. Brecht agreed that considerable improvement could be effected by saving only the best heads for seeds. It was also decidedly beneficial to secure a change of seed occasionally, especially if obtained from a cooler district.

Balaklava, September 6.

Present—Messrs. A. Manley (chair), P. Anderson, A. W. Robinson, W. Tiller, G. C. Neville, T. A. Thomas, J. Vivian, W. Baker, and E. M. Sage (Hon Secretary).

Harvester v. Stripper.—Mr. Neville initiated a discussion on this subject. A farmer cropping 300 acres with a yield of 900 bags of wheat will find two strippers and one winnower sufficient to harvest the crop. Now he is advised to use the complete harvester, and put his strippers and winnower away to rust. It will take two harvesters to deal with 300 acres of crop; the first outlay for the new system will therefore amount to nearly £200. Allowing 5 per cent. interest and 7 per cent. for depreciation, we have £24 per annum on these two items. This, with 1d. per bag for dumping and sowing up bags, makes the cost 7d. per bag. Cleaning and bagging after the stripper can be done at 5d. per bag. Then there is the loss of weight when the harvester is used, as the crop must be quite ripe, and as the bags of wheat must be left in the sun for some time before they can be got under cover or sold, there is considerable loss from drying, equal, in his opinion, to 2 lb. to 4 lb. per bag. This loss was avoided where the wheat was left in heaps after stripping and sold, as was often the case, almost as fast as it was cleaned. The saving of the chaff was another important item. With the harvesters the lightest and best of the chaff is blown away, what remains being mostly backbone and straw. Even this is dumped in small heaps, and unless gathered quickly is blown about or spoiled by rain. With the stripper if the wheat heaps are made of fair size the chaff is easily kept together, and if covered with a few loads of straw will be safe and available for winter feed for stock. A farmer with 800 or more bags of this chaff has no need to fear that his stock will starve in a dry year. He considered that the chaff he saved was worth £20 a year to him. Mr. Robinson used three damp-weather strippers and a harvester last season. He found that with six horses worked in two teams of three each the latter machine turned out 40 to 50 bags of grain per day. The harvester could be used when the crop was too damp and tough for even the damp-weather stripper. He harvested 900 bags of grain with the harvester, and saved £22 10/ in cost of cleaning. The machine has not cost a penny for repairs, and was apparently as good as new. He had harvested 200 bags of grain before he started stripping. Mr. Tiller thought the harvester was the coming machine. It was a labour-saving machine, and he did not like hard work on a hot day, nor did he like to see his men doing it. The only fault he could find with it was in the loss of the chaff. Mr. Anderson agreed that the loss of chaff was a serious matter. A neighbour who used the harvester told him that it made the fields very dirty, as it scattered the light seeds about. While on large farms he believed the harvester would come into general use, he did not intend to discard his stripper. Mr. Vivian considered that his stack of cocky chaff paid for the whole cost of stripping. Members generally agreed that the question of saving the cocky chaff was a great consideration to the farmer.

Oats for Hay.—Owing to a printer's error Mr. Ham's remarks at previous meeting (page 153, September issue) were mutilated. In referring to Cape oats for hay, he stated that he found they made good hay if cut early, but he preferred to strip the oats and feed the grain with wheaten hay or cocky chaff.

Kingston, September 6.

Present—Messrs. W. W. Pinches (chair), T. Redman, J. Cooper, G. J. McBain, F. W. Barnett, G. Bird, B. F. Clark, T. A. McCulloch, H. Fraser, E. M. Flint, F. S. Wight (Hon. Secretary), and three visitors.

Membership.—It was decided that when filling vacancies in the membership roll, nominations should be made at one meeting and confirmation or ballot, when more than the required number are nominated, take place at the following meeting.

Haymaking.—Mr. McCulloch read a paper on this subject, to the following effect:—

His experience in the growing of hay extended over a period of 30 years. In dealing first with the preparation of the land for cropping, the soil and climatic condition will, to a large extent, govern operations. First there was the sandy soil with a hungry white sand beneath; to cultivate this deeply is injurious. Three or four inches is as deep as it is safe to turn this up. The same applies to the rich black soil overlying white pipeclay. The heavy soils, with good yellow or red subsoil, should receive deeper cultivation. The land should be cleared and well ploughed—not left standing on edge. In this locality the land should be sown dry; if wet the horses trample the ground too much. Finish seeding operations by the end of May if possible. For first-class hay he preferred a mixture of white Tuscan wheat and Algerian oats. White Lamas and Purple Straw were also good for hay. The latter being fine in the straw and with large heads had a tendency to bend over unless supported by strong-growing oats. He thought that generally New Zealand oats produced the heaviest crop, but stock seem to prefer the Algerian. If the surface of the soil become hard and caked run the harrows over it when the plant is 4 in. or 5 in. high. This should be done while the soil is fairly dry. Rolling serves two purposes; it breaks the clods and firms the soil round the plants, and also levels the ground. Cut the crop while on the green side, and stook immediately after the binder or mower. If in sheaves do not pack the stooks too much, or mould may do some damage. The sheaves should be placed so that the wind can penetrate. Stacking should not be commenced for at least 10 days; if the hay is put into stack too soon considerable injury is likely to result. When stacking add a little salt; about 15 lb. to 20 lb. of salt will not have much effect. He generally sowed one bushel of wheat or two bushels of oats if sowing either alone. In this locality much of the land will grow only two or three fair crops of wheat, but oats will do well afterwards. Wheat after oats does not seem to do well. His experience with the use of phosphates was limited; he had applied it as a top-dressing during August, and harrowed it in, but could see no result.

Morgan, September 13.

Present—Messrs. R. Windebank (chair), A. F. Heinrich, H. Wohling, and W. G. Plummer (Hon. Secretary).

Feeding Horses.—Mr. Wohling found that salt mixed with straw or cocky chaff not only improved it, but made it more palatable to horses. His horses eat every bit of straw or chaff treated in this way. Most farmers were aware of the evil results from feeding horses on hay that had grown very coarse and strong; he found, however that if this hay or chaff is thoroughly steamed no harm will result from its use.

Marketing Honey.—Mr. Plummer thought beekeepers were not making as much money as they might out of their honey. Most apiarists put up the honey in 60 lb. tins, which were too large for the ordinary consumers. If it were put up in 2 lb., 7 lb., and 14 lb. tins he believed there would be a much larger sale for it, and prices would be better. As it is the honey is sent to Adelaide in large tins and bought up by dealers, who put it up in smaller packages; then it is sent back to the country districts for sale. Honey has been sold in Adelaide in 60 lb. tins at 2d. per lb., and then sent back to the local storekeeper in 2 lb. tins, for which he charges 8d. to 10d.

Stansbury, September 6.

Present—Messrs. A. Anderson (chair), P. Anderson, C. Faulkner, J. Sherriff, G. Jones, G. Brundell, J. Antonio, and P. Cornish (Hon. Secretary).

Founder in Horses.—Mr. Antonio said for this trouble he found boiled linseed and soda very useful.

Scrub Exterminator.—Members would like to know whether there was any chemical that could be used as a scrub exterminator without injuring the soil.

Bureau Meetings.—It was decided that to increase the interest in the meetings each member take it in turn to be responsible for the principal business of the meetings.

Woolclassing and Wheatgrading.—The Chairman read a paper on this subject to the following effect:—

It was generally admitted that most farmers did not class the wool as it should be, but they would also agree that with small lots classing was out of the question, as there would be far too many little parcels. He thought, however, something might be done by a system of co-operation. His idea was to utilise the organisation they already had established — viz., the Farmers' Co-operative Union. Let each farmer shear his sheep, skirt the wool, and generally get it up as well as he can. All the wool should be put together, merino and crossbred, light and heavy wools, and sent to the wool store for classing. The Union would require an expert to undertake this work. This expert would carefully open out each bale on a large table, and classify each fleece according to quality, &c., crediting the grower with the weight of each class as the wool is weighed. The next lot would be treated in the same way, and in the end he would be able to make up fair sized parcels of each class. The farmers would benefit from the adoption of some such practice, as buyers would pay more for large parcels of properly classed wool than they will for small lots of irregular quality, as he would be able to buy exactly what he wanted. At present he often had to buy wool he did not want in order to secure what he required, and he naturally did not give as much as he otherwise would. To get the best price for their wool, the growers must do all they can to meet the buyers. The scheme suggested would, in his opinion, do this, and it should not prove expensive, as the only extra outlay would be for labour. He would ask the farmers, many of whom were shareholders in the Farmers' Union, to give the matter careful consideration.

There was another matter of importance to farmers that might be dealt with under somewhat similar conditions, and that was the grading of wheat for export. Machinery at various shipping centres would be required for this. The farmers could send their wheat to the stores, where it would be graded to regular qualities, instead of all being mixed together, as at present. The higher grades would naturally fetch the best prices, and the farmer growing the best wheat would be paid accordingly. Their object should be to get up their produce in the best way to suit the purchaser's requirements, and unless they did this they could not expect to keep up with their competitors.

Some discussion ensued, and it was agreed that there was considerable room for improvement in the handling of both wheat and wool.

Pyap, September 10.

Present—Messrs. J. Bowes (chair), W. C. Rodgers, W. Axon, C. Billett, S. Holt, G. H. Mills, and B. T. H. Cox (Hon. Secretary).

Peach Aphis.—Mr. Axon reported that this pest had appeared on peach trees, but at present was not doing much harm. Tobacco water and kerosine emulsion were recommended.

Pigs.—Mr. Axon read a paper on this subject from report of Clarendon Branch in October, 1897, issue of Journal of Agriculture. Members generally agreed with the paper, but they would not allow the pigs to have the run of the garden in general. It was more profitable to confine them to a grass run, or on land where lucerne or other fodders are grown, than to feed them three times a day, as was the general practice on most small homesteads.

Lyndoch, September 18.

Present—Messrs. H. Kennedy (chair), F. Warren, W. J. Springbett, B. Ren, J. Woodcock, H. Springbett, R. Ross, P. Zimmermann.

Congress and Conference.—Chairman reported on proceedings of Annual Congress, and a discussion followed. Members agreed to attend the Conference of Branches, to be held at Angaston on November 5 and 6.

Grafting Vines.—Mr. W. J. Springbett read a paper on this subject to the following effect:—

The reason for grafting is that you get quicker returns than planting young vines, of course reckoning that you have unprofitable vines in your vineyard. Planting a new vineyard means waiting at least four years for any return at all, and it is very small at that. By grafting you get a fair return the second year, and in four years they are in full bearing. I don't hold with grafting vines from 25 to 30 years old, unless they are very vigorous, for, after they have been grafted about five years they fall back again to the state of the old vines before they were grafted. There are various methods of grafting, but I have only tried one, and that has always proved successful. Cut the vine off from three or four inches underground, taking care to cut through where the grain of the wood is straight (if possible); then pick out a part down the side of the stock as smooth as you can, avoiding lumps and hollows; place your chisel on the top of the stock so that it will split the stock down the required part; drive in the chisel with a mallet or hammer, so that the stock will split open about a quarter of an inch; then pare the split or cleft on either side with a knife to get a nice smooth bed for the scion (this is a great point in grafting). Now choose a scion, which you think will suit, according to the direction the stock has split; very often they go in a slanting direction, so that you can get a scion with a bend in it, which, when fixed in its place, will be in an upright position. In cutting the scion I prefer the wedge shape, as I think it insures the best fit; cut it from the eye or internode with a nice straight out on both sides, leaving it thinner on the inside; then fit it into the crevice, so that when the chisel is taken out the stock will close up again almost to its natural position. Any one who intends going to graft his vines should pick out the wood he requires as soon as the vines are pruned, taking care to get the wood from a good bearing, strong, healthy vine; pick out medium size wood, and as solid as you can get it. Wood with much pith is not good. After the cuttings have been selected tie in small bundles and bury them in some dry sand, in a dry, dark. airy place; an old box will do, as it is easier to keep them covered, which is one of the main points. They should be covered so as to exclude the air. Cuttings can be kept by burying in the ground, but the great drawback is that when they are unearthed for grafting most of the buds have shot, which makes it very awkward to handle without knocking off the shoots. When taken out of dry sand you will find them in the same state as when they were put in or taken from the vine. I do not know if it is the usual thing when grafting to carry the wood in water, but we have always done it, and find it answers very well; it seems to freshen up the wood if it has dried at all in keeping; and another thing the scions seem to cut better and cleaner; it prevents the gum or sap from sticking to the knife. Another great point is to have a good knife and keep it very sharp. I like a pocketknife myself if I can get a good one. I think the best time for grafting is just when the vines have shot about an inch—about the end of September in this district. The grafting we have done the last few years about 90 per cent. have taken. The last lot were done when the shoots were fully 6 in., and we had quite as good results. The only difficulty in late grafting is keeping back the scions. After the vines have been grafted a week or so they should begin to burst, and should be looked to, especially if there has been a good fall of rain since they were grafted;

the soil around the scions should be loosened with a hoe or a trowel, as the scions which may show no signs of bursting from the eye above ground, in eight out of ten, will start at the eye which has been buried. If the soil has set tight these young shoots cannot come through, but curl up in a ball under the soil; hence the necessity for early attention. After the scions have made a good start a stake should be driven in at each vine; wattles will do, and can be got very cheap. About 2 in. in diameter and from 3 ft. to 3 ft. 6 in. in length will be found about the most useful size; if they are too long the wind has too much power, and often they are blown down. When the shoots have grown about 18 in. they should be tied to the stake, bindertwine being suitable for this purpose. As they grow longer, the shoots require to be tied again higher up the stake, otherwise they will often break off at the first string. If the shoots should grow much higher than the stakes it is advisable to top them. I know that most of the professional viticulturists are against topping, but some of the vines grow so strong and vigorous that they are blown and twisted all to pieces if not topped. When tieing all surplus shoots should be rubbed off, only leaving those that are required to form a crown the next year where that can be done. I do not think it a good thing to rod-prune grafted vines the second year, unless they are extra strong in growth; try to form a good head or crown by short spur pruning, and at three years rod prune with one or two rods, according to strength of vine.

A good discussion followed, and a vote of thanks was accorded to Mr. Springbett.

Bonedust.—Mr. H. Springbett tabled samples of foreign matter found in some bonedust he had purchased. Samples to be forwarded to the Inspector of Fertilisers.

Port Broughton, September 15.

Present—Messrs. W. R. Whittaker (chair), J. Harford, E. Dalby, E. Gardiner, E. Dennis, J. Bates, A. E. Button, W. Dalby, and J. Barclay (Hon. Secretary).

Congress.—Mr. Whittaker reported on proceedings of Annual Congress, and discussion took place on the saving of cocky chaff from the complete harvester. Mr. Gardiner said his experience was that practically the whole of the chaff could be saved with little loss of time.

Koolunga, September 18.

Present—Messrs. T. B. Butcher (chair), J. Button, E. J. Shipway, G. Jose, W. T. Cooper, J. Sandow, R. H. Palmer, J. C. Noack (Hon. Secretary), and one visitor.

Membership of Branches.—Mr. Butcher reported on proceedings of Congress in connection with the officers' conference. Members were of opinion that the suggestion for honorary members as proposed at the conference might in some modified form be adopted with advantage. Possibly honorary members, while having all other advantages of membership, might be asked to pay for The Journal of Agriculture at something less than the ordinary subscription rates.

Agricultural College.—Mr. Sandow reported on the farmers' visit to the Agricultural College, and expressed the opinion that the implements used at the College should as soon as possible be supplanted by more modern types.

Swede Turnips.—Mr. Jose tabled a very fine sample of turnip grown on his farm. It measured 20¼ in. in circumference, and weighed over 7 lb.

Mount Pleasant, September 12.

Present—Messrs. W. Lyddon (chair), P. Miller, J. Maxwell, W. Royal, and H. A. Giles (Hon. Secretary).

Grass Manures.—Members accepted invitation of Hon. Secretary to visit his homestead on October 10 to inspect results of application of manures to grass lands. Members stated that the crops were progressing favourably, but 2 in. of rain was required to ensure good returns.

Port Pirie, September 20.

Present—Messrs. T. Johns (chair), G. M. Wright, E. J. Hector, G Hannam, W. Smith, J. Lawrie, T. Jose, and T. A. Wilson (Hon. Secretary).

Congress.—Delegates reported on proceedings of Annual Congress, and discussion ensued. Members agreed in the main with most of the papers, but not with Mr. Trengove's figures on "Harvesting Wheat Crops." They considered value of the straw left after the stripper should be allowed for. Professor Perkins' estimate of yield of wine per acre was considered too low, and it was thought that, owing to the dryness of the district, the vinegrowing industry could not be extended in this locality. Exception was also taken to the mower, horserake, and stripper being condemned as wasters by Mr. Daniel, as often they are indispensable, as the first two will be this year in this district. Opinions differed as to wisdom of leaving strip of land inside the fence uncropped. The results of the officers' conference were considered unsatisfactory, but members considered this mainly due to limited time available for the purpose.

Mount Compass, September 13

Present—Messrs. M. Jacobs (chair), R. Peters, J. Jenkin, W. Gowling, D. J. Hutton, H. McKinley, F. McKinley, F. Slater, A. Bishop, and A. J. Hancock (Hon. Secretary).

Utilisation of the Land.—Mr. Jenkin initiated a discussion on making their holdings more profitable and attractive. He thought they often depended too much on the potato crops, which were so liable to damage by frost, disease, and drought. He advised trying wattles on the sandy soil; seed was cheap, and there was plenty of land available. At the present price the grower should net £3 10/ per ton on the bark. Then poultry could be made more profitable, and be conducted on a larger scale. He was at present paying 5/ per bushel for wheat, and still getting a profit of 1/6 per bushel by feeding it to his fowls. Nearly all of them keep pigs, and if they were to grow more feed for them they would pay well. A friend of his who had to buy most of his pig's food still finds it cheaper to grow than to buy meat. Field peas and other crops might be grown in this district, especially for pig feeding. Mr. Slater pointed out that before they could grow wattles they would have to clear away the scrub. He recommended growing Swede turnips for pigs. The crop was more reliable than peas. Mr. Jacobs considered peas the best crop to grow for pigs. Swedes robbed the soil to a very great extent, necessitating the use of more manure; whereas peas added to the productiveness of the land. Mr. Gowling said mangolds would be found more profitable than Swedes.

Royal George Peach. — Mr. F. McKinley asked the best treatment to induce this peach to fruit near the main stem, instead of at the top or ends of the shoots. [This is a fault that cannot be cured, but by letting plenty of light into the tree and pruning the shoots after the fruit has set on the lines indicated in Mr. Quinn's bulletin on "Pruning," much of the trouble can be prevented.—Ed.]

Orroroo, September 19.

Present—Messrs. E. Copley (chair), J .Moody, T. Knight, W. S. Lillicrapp, W. T. Brown, W. Robertson, and T. H. Tapscott (Hon. Secretary).

Congress.—Mr. Robertson reported on proceedings of the Annual Congress.

Horses' Teeth.—Discussion took place on the question of attention to horses' teeth. Circular dealing with the necessity for keeping the teeth in good order gave rise to the discussion. Irregular and uneven teeth resulted in much waste of food besides, the horses did not masticate the food properly, and while swallowing considerable quantities of food suffer from various complaints. The Chairman stated that he had seen very considerable improvement in horses after attention had been given to the teeth.

Watervale, September 15.

Present—Messrs. C. A. Sobels (chair), O. H. Castine, H. Scovell, S. Solly, H. Beck, E. W. Castine, W. Smith, and E. Treloar (Hon. Secretary).

Compressed Fodder.—Mr. C. A. Sobels tabled samples of compressed fodder, which was inspected with interest by the members, who were of opinion that this industry would, in the near future, prove of great value to the farmers of South Australia.

Horse Breeding.—Considerable discussion on this subject took place, and it was generally agreed that it was a great mistake to breed from a roadster entire. To get a good, useful, active horse, a blood stallion, mated with a draught mare, was favoured.

Congress.—Delegates reported on proceedings of the Annual Congress, which they considered to have been very instructive.

Johnson Grass.—Mr. Treloar wished to know whether Johnson grass should be sown at the same depth as holcus, and when should it be sown. [This will depend partly on the soil and also on the question of frost. Sow at any time from middle of September to end of October. On moist soils, or where the land can be irrigated, seed can be sown considerably later than this; cover the seed to depth of 1 in. to 1½ in.—Ed.]

Season.—The recent rains have been of great benefit to the crops, and to orchards and vineyards. There is now every prospect of a good return of both hay and wheat in this district.

Kapunda, September 13.

Present—Messrs. W. M. Shannon (chair), H. T. Morris, G. Teagle, C. P. Weckert, W. Flavel, H. A. Holthouse, J. H. Pascoe, B. R. Bayner, Pat. Kerin, J. A. Schultz, and G. Harris (Hon. Secretary).

Annual Report.—Ten meetings held, with an average attendance of over 10 members; three papers read and discussed, and a special meeting held to hear an address from the representative of the Farmers' Co-operative Union. The officers were thanked for their services and re-elected. A vote of thanks was also accorded to the proprietor and reporter for the local paper for the publicity given to the work of the branch.

Pig-breeding and Dairying.—Some discussion took place on these subjects. Mr. Holthouse urged the importance of improving the producing qualities of their dairy herds. It was better to keep one cow, giving 500 lb. of butter per annum, than two giving each 250 lb. The improvement could be brought about by breeding only from cows noted for their milk production, and securing bulls from proved milking strains of cattle. Sufficient attention was not given to pig-breeding; he had noticed that at the monthly sales pigs of the Berkshire strain always brought the best prices. Mr. Teagle had kept various breeds of pig, but found none to surpass the Cheshire; they were small eaters and good doers; one 10 months old, which he killed recently, weighed 268 lb.

Cherry Gardens, September 9.

Present—Messrs. W. B. Burpee (chair), T. Jacobs, J. Lewis, C. Lewis, G. Hicks, E. Woods, E. Wright, W. Gardner, C. Ricks (Hon. Secretary), and one visitor.

Black Spot of Potatoes.—Discussion on this subject took place. It was noted that the early potatoes were most liable to the disease, and of these Beauty of Hebron and White Elephants suffered most. New seed from Victoria did not suffer the first season, but if the seed from these was grown again it appeared to be subject to the disease. Mr. Ricks suggested trying the effect of a dressing of lime on both potatoes and onions, and several members agreed to do this and report results.

Riverton, September 20.

Present—Messrs. H. A. Hussey (chair and Hon. Secretary), D. Kirk, A. Davis, T. Gravestock, and T. Gray.

Congress.—Mr. Davis gave a short report on proceedings of the Annual Congress.

Davenport, September 18.

Present—Messrs. W. J. Trembath (chair), T. McDowell, J. Roberts, A. McDonald, T. Totman, A. J. McGrath, J. E. Leckey (Hon. Secretary), and one visitor.

Poultry Show.—Mr. Holdsworth sent in paper dealing with the local Poultry Show. While the quality of the exhibits was good there was a lack of competition. In dressed poultry there were very few exhibits, and the live classes for the production of table poultry showed a lack of suitable birds. The winners in the best classes came from the same yards as last year's winners, showing that the owners were maintaining their interest. The show had undoubtedly been the means of increasing the interest in poultry-breeding, and if the Bureau could, in conjunction with the Poultry Society, help to foster this interest the district would benefit. He suggested that it would be a good plan if the Bureau could keep a list of names of reliable breeders, with particulars of stock, prices, &c., for the information of the residents. Every effort should be made to encourage the production of table poultry. A very interesting discussion followed, and the general opinion was that the Poultry Breeders' Association, which was an offshoot from the Bureau, was serving a good purpose. It was suggested that the Association, in addition to holding shows, should endeavour to arrange for lectures on the various branches of the industry.

Congress.—Delegates reported on proceedings of the Annual Congress, and regret was expressed that no definite results had been attained by the holding of the officers' conference.

Saddleworth, September 19.

Present—Messrs. J. H. Frost (chair), R. Marshall (of Council for Agriculture), W. H. Bee, Geo. Benger, J. P. Daley, W. Heaslip, W. E. Leeder, J. H. Neill, F. Plant, F. Plueckhahn, J. Scales, F. Waddy, F. Coleman (Hon. Secretary), and eight visitors.

Improvements in Wheat.—Mr. Rich. Marshall, who attended by special invitation, read an interesting paper on this subject to the following effect:—The principles applied to the improvement by breeding of cattle and sheep with such success, were equally applicable to the vegetable kingdom, with the advantage of having in the breeding of wheats a much greater increase and quicker result. The in-and-in-breeding of the wheat plant would tend towards deterioration unless careful and methodical selection was made of the best seed to sow. Major Hallett succeeded in four years in increasing the size of ears of wheat from four and three quarter inches to eight and three quarter inches; the grains from 70 to 123 in the ear, and the stools from eight to 52. It was doubtful if high milling quality could be obtained by selection alone. The gluten contents of the wheat, the strength of the flour, was neglected, the flour would take a smaller quantity of water to make a dough of a given consistency, and the bread would be poorer in nitrogenous (albuminoid) substances. Selection with care would improve any variety. The following points were to be aimed at:—Freedom from red rust.—The Purple Straws were, as a rule, liable to rust, even rust in the flag affected the grain to a slight extent; productivity and weight of grain; eliminating sterile spikelets at base of ear; increase of grains in ear and absence of beard. To be avoided were:—Weakness, especially in the early varieties, the best test was to allow the wheat to stand for several weeks after it was ripe before stripping; brittleness, often due to thin walled straws; allow the wheat to stand and apply the same test with regard to shelling out, due to loose or brittle chaff. Long and comparatively thin straw was valuable for hay crops, while a short straw was preferred for wheat, since the energy of the plant went to an increase of grain. Flag when erect and narrow gave less lodgment for rust spores, and a tough cuticle also helped to keep out fungus growths. In crossbreeding use the strength of the one parent to counteract the weak point in the other. The strongest floured wheats were the Fife and Bluestem families, from which was made the strongest flour known; among Australian wheats, Jonathan (a Fife-Indian wheat) was the strongest in flour, giving 50 lb. more bread from the 200 lb. sack of flour than Purple Straw; this would work out to over 35 million more loaves of bread in the year in Australia obtained from Jonathan than from an equal quantity of Purple Straw wheat. Jonathan was found to yield as good a crop per acre as Purple Straw. The breeding of wheats was yet in its infancy. In reply to questions Mr. Marshall said that South Australia possessed climatic and soil conditions favourable for the growth of the best of wheat; he referred to the late Allan Bell, and his success against the world at the Paris Exhibition with wheat grown on his farm at Mount Barker. The fact that we could grow good crops with manures containing phosphoric acid only showed that we had plenty of nitrogen. This essential nitrogen appears to be sufficiently available in our soils, but the strength of our Purple Straw wheats is only 45 to 48, while Jonathan is 68. In other words, the latter will take up 68 quarts of water to the 200 lb. sack of flour, while Purple Straws only take about 47. Only about one-ninth of the water added to the flour is lost in baking. "Comeback" was another Indian-Fife wheat yielding a flour of very high quality in all respects, colour, strength, and rich in gluten. Mr. Marshall exhibited samples of these wheats and of Duluth, Manitoban, and Russian wheats, also of "Lake of the Woods" flour, valued at Port Adelaide at £13 5/ per ton, while the best South Australian is worth only £9 10/ per ton. Mr. Marshall also showed, on some green heads of wheat, the method of cross-fertilising adopted, emphasising the need of removing the anthers before they become ripe and shed their pollen, and of introducing the fresh anthers when ready to burst open. A hearty vote of thanks was accorded Mr. Marshall for his interesting address.

20-Acre Wheat Contest.—Judges for this contest were appointed, entries to be in by October 24 next.

Strathalbyn, September 19.

Present—Messrs. W. M. Rankine, R. Watt, P. Cockburn, and J. Cheriton (Hon. Secretary).

Increasing the Usefulness of the Bureau.—The Hon. Secretary reported on proceedings of the Annual Congress in Adelaide. He expressed strong disapproval of the paper read by Mr. Summers at the officers' conference. The paper was nothing short of a series of reflections on the members of the Bureau, and especially on the officers. It contained numerous instructions and suggestions for conduct of the business of the branches which were already carried out, and in his opinion the reading of the paper was a huge mistake from which no good would result. The proceedings of this meeting were on the whole very unsatisfactory. [While we all regret that the officers' conference did not achieve the results expected, I am convinced that members generally will not look on the paper in question as an attempt to dictate to or reflect on the officers of the various branches. Most members will admit that, taken on the whole, there is plenty of room for more systematic and definite work on the part of the branches, and if Mr. Cheriton could spend a few days in the Bureau office he would see the necessity for several of the suggestions to which he takes exception. In any case I hope that the branches generally will criticise Mr. Summers' paper, together with the resolutions carried at the Conference, and those members who did not get an opportunity to bring forward suggestions for improving our system of working will do so at their Bureau meetings.—Ed.] Mr. Cheriton also reported on proceedings of the conference at Port Elliot and on matters of interest at the Adelaide Show.

Morphett Vale, September 2.

Present—Messrs. L. F. Christie (chair), G. Goldsmith, F. Pocock, E. Perry, J. McLeod, and J. Bain.

Harrowing Fallow Land.—Members reported that they were following the advice given at a previous meeting by Mr. Smith, and were harrowing the fallow immediately after ploughing. Mr. Goldsmith had noticed that on last year's fallow, where the land was harrowed down fine, the crop this year had come up evenly, but on the cloddy fallow a lot of seed had malted.

Sorghum.—In reply to question Mr. Pocock advised thorough working of the land before seeding—10 lb. of sorghum per acre should be sown. Put the seed in the furrows or between them, having the rows about 30 in. apart.

Horsebreeding.—Mr. Christie was of opinion that their horse stock had greatly deteriorated, and if some enterprising men would import a few good Clydesdale stallions and mares it would be beneficial. The Clydesdale was, in his opinion, the best draught horse. Possibly something in this direction might be done by the co-operation of farmers. Mr. Pocock thought the stallions were often travelled too much; it might be better to station them in some central part of the district. Mr. Bain said many farmers would have better stock if they gave the foals more attention the first year; too often they were half-starved. There was another matter wanting attention, and that was the disposal of old horses. How many horses after giving their masters good service for many years are, when they get old, put into the market for sale, often to be ill-used by their new masters. Sometimes they were allowed to pine away through weakness until they get down, and are then knocked on the head. He thought any farmer having an old horse which is of no use to him, should have it put out of its misery with as little pain as possible.

Narridy, September 20.

Present—Messrs. J. Darley (chair), B. Flavel, H. B. Turner, A. Bairstow, T. H. Smallacombe, T. Dunsford (Hon. Secretary), and one visitor.

Congress.—Considerable discussion took place on paper read by Mr. C. E. Daniel on "Robbers and Wasters on the Farm." Members generally agreed with the main contention of the writer of the paper.

Forest Range, September 20.

Present—Messrs. G. Monks (chair), J. Vickers, R. Green, F. Green, A. Townsend, J. G. Rogers, J. Green, A. Green, F. Mason, W. McLaren, H. Waters, E. Rowley, F. Green (Hon. Secretary), and six visitors.

The Pig Industry.—Mr. H. A. Monks, of "Ye Monks of Old" Bacon Factory, gave a very instructive address on this subject. He advocated the Essex boar crossed with Berkshire or Poland China sow, and then breeding afterwards from the first cross. Styes should be constructed with solid walls and cement floors, with a small wooden rack for the pigs to sleep on, if there is any shortage of straw. Styes should be fully roofed and well ventilated. To prevent the sows crushing their young he had a small wooden ledge, not quite the height of the sow, placed on the inside walls of the sty; the young would get under this, and avoid being crushed between the body of the sow and the wall. Farrowing sows should be allowed to run in the open paddock until within a fortnight of farrowing, when they should be brought into a warm sty. The styes should be cleaned out every day and a tank constructed to receive the liquid manure. He had manured a paddock of 11 acres with this liquid, with the result that 200 sheep failed to get ahead of the growth. There was a considerable future before the pig industry if conducted in a systematic way. Mr. Monks stated that when he started at Littlehampton 12 years ago the first year's output was 351 pigs, valued at £614; last year it was 10,568 pigs, valued at £30,513.

Maitland, September 6.

Present—Messrs. J. Smith (chair), T. Bowman,, W. Wilson, O. Treasure, C. F. G. Heinrich, J. Kelly, H. Bawden, H. G. Tossell, E. W. Moody, and W. Bowey (Hon. Secretary).

Manuring Pastures.—Mr. Bowey reported on experiments with various manures received from the Department. The manures caused the grass to start earlier than where no manure was applied, but taken altogether he was afraid the extra growth was not sufficient to cover the outlay for the manure. The grass on the manured plots was taller, but as far as he could judge there was very little difference in the undergrowth. When he turned stock on the cattle showed a marked preference for the grass on the manured land, and did remarkably well on it. Mr. Tossell said he had inspected the plots, and agreed that it was doubtful whether the extra return would compensate for the expense for manure.

Saltbush.—The Hon. Secretary tabled sample of saltbush raised from seed received from the Northern Territory. The plants had made splendid growth, and members who had failed with the seeds they received, thought this would prove very valuable.

Deterioration of Stock.—Discussion took place on paper read by Mr. Forster at Narracoorte. Members thought there had been considerable improvement in the quality of light horses, which were generally a credit to the state, but in draught stock there was room for improvement.

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of persons registered and found employment by Government Departments and Private Employers from August 29 to September 29, 1902.

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths	75	162	275
Masons and bricklayers	—	—	4
Carpenters	3	—	1
Painters	5	—	—
Plumbers	1	—	—
Fitters and turners	1	—	1
Blacksmiths and strikers	4	—	—
Boilermakers and assistants	—	1	2
Moulders	1	—	—
Compositors	1	—	—
Watchman	—	—	1
Tentmakers	—	—	1
Apprentices	14	1	5
Cleaners	6	—	—
Porters and junior porters	5	1	4
Rivet Boys	1	—	—
Totals	117	165	294

September 30, 1902. A. RICHARDSON, Bureau Clerk.

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NOTES AND COMMENTS.

The French vintage is usually not in hand until September. At the end of July we notice that the "Progress Agricole" estimates the total yield at 880 million gallons, which, it is said, will not meet the demands of local consumption. They anticipate imports of Italian and French wines, with a profitable rise in prices. This, no doubt, will be pleasant news to French growers, who of late years have suffered much from overproduction and want of organized markets.

In July number of the "Revue Tunisienne" we note a practice which, if not already followed here, should prove useful to local olive growers. Both in the total yield of the tree and the individual size of the fruit the olive tree benefits much by regular pruning. The operation, however, is somewhat tedious, and consequently frequently neglected, to the loss of the owner. Similarly, olive picking is a somewhat tedious operation. Why not combine both operations? That is what Mr. Dumont, of Khanguet (Tunis), has apparently done. When the fruit is ripe a canvas is spread under the tree, and the pruners set to work. Their work is simplified by the fact that the olive, like the peach, bears its fruit on the previous year's wood, and that, in principle, wood that carries fruit should make room for new wood of the year. In practice, of course, it is not always possible to remove all wood that has fruited; much of it, however, may be removed with advantage. In consequence, most of the crop falls to the ground still attached to the shoots, from which it is rapidly removed by women and children. When the pruners have completed their work what remains on the tree is combed off with the fingers sheathed in sheep's horns.

In the annual report of the Victorian Department of Agriculture for the year 1901-2 attention is called to the gratifying signs of improvement in the quality of the butter exported from that State. Mr. Crowe reports that nearly 85 per cent. of the butter exported received 95 points and over out of a possible 100 points, as compared with 65.3 per cent. of the total the previous year. Mr. Crowe claims that the work done in connection with the grading of butter for export resulted last year in an increase of over £18,000 in the value of Victorian butter sent out of the State. This contrasts rather forcibly with the following extract from the annual report of Messrs. W. Weddel & Co.:—"The best friends of the Australian dairy produce trade cannot but regret that the steady improvement in the quality of butter which Australia exhibited regularly until last year has not only ceased, but, on the whole, has actually receded. It is true that there are certain factories and a limited number of brands which are equal in quality to anything formerly received, but the bulk of the butter is inferior to what it was only two years ago."

Some rather expensive observations were made at the Mont Experimental Station relative to the feeding of smutty oat hay to cattle. During the winter of 1898 a dairyman near Bozeman lost 12 cows. The animals had been receiving clover and alfalfa previous to being fed the oat hay. The oat field was so badly smutted that the owner thought it worthless for grain. He therefore cut the oats before they became ripe, and stored the material for hay. Out of 30 cows which received but one feeding of this hay, 12 died within 18 hours with symptoms of gastric disturbance. The feeding of the oat hay was discontinued, and, as a result, there was no further loss. The station concludes that experiences of this kind suggest the desirability of treatment of seed oats for smut, and also serve as a warning to stockmen.

Lord Rosebery carries on at Dalmeny, England, what is practically a private agricultural experiment station, to which very many visitors go every year. Some exceptionally heavy yields, both in grain and root crops, are secured from the test plots, and a recent visit by a number of Scottish farmers elicited some useful information concerning their treatment. One very important statement by the manager of the farm was concerning the use of lime. He stated that each year every acre under crop receives a dressing of 5 cwt. of ground lime, the main object being to encourage and facilitate the action of the nitrifying bacteria which have such a far-reaching influence on the fertility of the soil. It was admitted by the visitors that the Dalmeny crops were far above the average of the best crops, and they were disposed to attach considerable importance to this practice of liming the soil.

The showery, close weather experienced during October has had its drawbacks. It has been decidedly favourable to the development of all fungus diseases, and has, at the same time, been against effective spraying for scab and shothole. The growers of apples and pears in the hills district who have not sprayed their trees with Bordeaux mixture are likely to see the folly of this neglect, and those who have looked after their trees are likely to reap the benefit of their work. The continuance of showery weather will also militate against the success of experiments with arsenical sprays for the suppression of codlin moth. Such weather as we have experienced of late emphasizes the necessity for powerful spray pumps, to enable the growers to get over their orchard as quickly as possible during favourable weather.

Mr. Molineux says there is only one way to get a perfect green hedge quickly, and that way is to put the plants at the proper distance apart, and then to plait them together horizontally whenever there is sufficient growth to enable this to be done. Instead of clipping the young plants three or four times a year, the whole of the growth of the plants is preserved. There is a constant production of lateral shoots from the bend, which fill up the space from the surface of the ground to the top of the hedge, which becomes so dense that a cat can hardly creep through, and an elephant cannot breach it.

DEPARTMENTAL NOTES AND WORK.

At the request of the Royal Agricultural and Horticultural Society, Professor Perkins acted as judge of dry wines and cider at the spring show. Mr. F. H. Snow, member of the late Central Agricultural Bureau, acted as judge of sweet wines. Both judges expressed themselves satisfied with the wines as a whole. We congratulate Messrs. Penfold & Co. on the numerous prizes they were fortunate enough to secure in the sweet wine class.

During the month of October the Professor of Agriculture spent one day at Kapunda acting as judge of grains and miscellany, and acted in the same capacity at Balaklava on September 26. The Professor of Agriculture has addressed Agricultural Bureaux and Conferences during October at the following places:—October 6, Mallala; October 9, Stansbury; October 10, Minlaton; October 11, Yorketown; October 16, Forest Range; October 17, Saddleworth; October 23, Koolunga. Practically eleven days of time was consumed in this work.

The number of students at the College is 45, being one less than at the close of the second session for 1902. Two students have severed their connection with the College, and one new student has joined.

On October 10 the Inspector of Fertilisers attended special meeting of Mount Pleasant branch, mainly for the purpose of inspecting results of experiments in the manuring of grass lands being carried out by Mr. H. A. Giles, of Mount Pleasant. On October 16 Mr. Summers attended the Conference of Hills Branches at Forest Range as a representative of the Department of Agriculture.

Mr. Quinn has visited Angaston and Summertown in connection with the spraying tests now in progress, and has completed arrangements for the whole series. He has also acted as judge in the horticultural divisions at the shows held at Penola and Hamley Bridge. The question of arsenical spraying has been much in evidence, and much of his time has been spent in answering enquiries and giving instruction in connection with mixing this and other spray washes. An address on the same subject was delivered at the Conference of Agricultural Bureaux at Forest Range. Owing to the great damage caused to the peach trees by the black aphides and the need for a more complete remedy than spray washes afford, Mr. Quinn made some tests in fumigating peach trees with hydrocyanic acid gas in the daylight as far back as 1896. These were very successful, and subsequently he induced one or two growers to adopt the practice. During the month, in conjunction with Mr. Arthur Quick, of Marion, and Mr. H. E. Laffer, the superintendent of the vineyards and orchards at Roseworthy Agricultural College, he has been experimenting with cheap coverings made of calico. These, however, without some dressing are not sufficiently close in fibre in our dry climate, and many of the aphides recover after appearing to be dead and motionless for some time. The calico tents are now being dressed with experimental substances, and further efforts will be made in future.

During the month ending October 25 3,688 cases of fruits, consisting chiefly of oranges and lemons, have been examined by inspectors prior to export to Victoria and New South Wales. Of these the greater number were lemons, and they went to supply the shortage in the Melbourne markets. The local market has been relieved thereby. Broken Hill took vegetables to the extent of 2,251 baskets, and 17 parcels of plants were passed for interstate export. Imported fruits, chiefly composed of bananas from Queensland and apples from Tasmania, were examined for admission to the extent of 8,076 cases. The latter fruits are now finished for the season, and upwards of 13,000 cases have been brought into South Australia from Tasmania between May and October. Twenty-two consignments of plants have been admitted during the month.

During the month Inspector Brown has been fully employed in this work. In the Clare district the Orchard Inspector has spent four and a half days making 57 visits to orchards and gardens in the neighbourhood, instructing owners into methods of combating codlin moth and other pests. The inspectors in the other districts have not yet begun operations. A new inspector (Mr. Jas. Hart) has been appointed at Stirling North to inspect fruits consigned to Broken Hill.

COUNCIL OF AGRICULTURE.

The monthly meeting of the Council of Agriculture was held in Adelaide on Wednesday, October 29, there being present the Chairman (Mr. R. Caldwell), Col. Rowell, and Messrs. Krichauff, Bruce, Sandford, Laffer, Yelland, Miller, Basedow, Marshall, and Murray, and Professor Perkins.

Messrs. Marshall, Dawkins, Yelland, and the Chairman were appointed members of the Agricultural College Committee. It was decided that the committee should visit the College at least once a quarter.

The Treasurer intimated that he could not provide free passes over the railways for members of the Council, but will provide tickets for members attending meetings and for members of committees when travelling on public business at the request of the Council.

Members commented on the fact that nothing had yet been done to give effect to the resolution of the Council re provision of suitable slaughterhouse at the College.

The Minister intimated that the question of providing funds for the establishment of a library for the students at the College would receive consideration in connection with next year's estimates; also, that the Principal had been instructed to furnish him with monthly report on the College work, which would be submitted to the Council.

The Secretary Victorian Department of Agriculture intimated that his Minister could not relax the prohibition on the importation of poultry from South Australia. Some discussion on tick took place, and it was decided that Mr. D. F. Laurie be asked to report to the Council on the whole matter, and also to suggest what action, if any, the Department should take in regard to the prevalence of poultry tick.

The Committee on Vine and Fruit recommended:—(a) That, except by post, all fruits and plants, or portions thereof, coming into South Australia should come by sea through Port Adelaide; (b) that pot plants be allowed in if, in the opinion of the inspector, there was no danger in importing them; (c) the clause in the regulations dealing with the sale of infected fruit be struck out, as it had been declared by the Supreme Court to be ultra vires; (d) and that every person importing plants, or portions thereof, be required to produce a declaration, signed by the grower or his agent, before a justice of the peace, of the source of origin of the plants, and that they had not been grown within 50 yards of any vines.

The recommendations of the committee were adopted, and it was decided to ask the Minister to approve of same. Mr. Laffer strongly protested against the recommendation re declaration. Any such certificate was absolutely valueless, as they had no means of checking it, and no remedy against any person outside the State making a false declaration. It would simply hamper trade and add to the expense.

Mr. Miller called attention to the heavy losses of milch cows from complaint variously named "impaction," "dry bible," "paralysis," &c. At a low estimate farmers had for several years been losing at least 1,000 head annually, and these losses were a serious menace to the dairying industry. He moved—"That the Minister be asked to have the complaint investigated by a competent veterinary." Mr. Marshall seconded the motion, which was carried unanimously.

Mr. Krichauff stated that, at his request, the Agent-General had secured about 1 cwt. each of three of the best Russian wheats for trial in South Australia. These would be distributed to selected farmers in due course. Mr. Marshall tabled small samples of strong-floured wheats from America. He had received these from Mr. Roach, of Burra, and suggested that they should be distributed in very small lots to a few reliable experimenters. He was convinced that these wheats would not pay to grow here, but they were of great value for crossing with our white wheats to produce good, strong-floured varieties, white in colour, and dry.

TRADE WITH SOUTH AFRICA.

Mr. V. M. Newland, Honorary Commissioner for South Australia, writes from Johannesburg on October 6 to the following effect:—

"Owing to the continuance of military restrictions, trade has not expanded in this country with the rapidity we all expected on the cessation of hostilities. Permits have to be obtained from the Director of Civil Supplies to get goods of any description up from the coast, and even when these permits are granted it is often a question of months before the merchandise is forwarded. Under these circumstances I have not deemed it advisable to suggest to merchants in your State that they should try consignments at present, as bond charges at the coast are extremely heavy, and whilst present conditions continue disappointment and loss are almost inevitable.

"This is the more disappointing, in that I have frequent enquiries for Australian wines, which are in high favour with those to whom they are known. Australian jams are fast superseding those of English or African manufacture, at all events as regards the Transvaal; but South Australian brands are quite unknown to the market generally. If done up in 1-lb. tins, at a price of say 3/ per dozen f.o.b. Port Adelaide, good business could be done, though South Australia is at a disadvantage owing to the smaller variety of small fruits she can offer. Given ordinary facilities, good business will yet be done in dried fruits; in fact, a sample of Renmark raisins I recently submitted to buyers here was most favourably commented on, the flavour being considered by many as much superior to European manufactures. South Australian flour is largely used, and finds ready sale.

"Potatoes are now selling on the local market at from 12/6 per bag of 160 lb. to 28/ for best; onions at from 18/ to 36/ per bag of 125 lb. New season's vegetables will be coming in, however, during the next four months, and prices are likely to rule rather lower.

"Oaten hay is worth about 22/6 per 100 lb.; lucerne (baled), say 12/6; local bran, about 12/ per 100 lb.; local dun oats, 25/ per 100 lb.; the duty of 5/ per 100 lb. on forage and 10/ per 100 lb. on oats being responsible for these high prices.

"The Customs tariff has been for some time past under the consideration of the Administration, and a number of alterations are likely in the near future.

"As regards the settlement of the country, and the fostering of agricultural and pastoral industries, the Administration is doing all in its power to help those desirous of going on the land. All land available has been very much over-applied for, and the Administration has now under consideration a number of farms for purchase and splitting up into small holdings. I recently called on the Agricultural Adviser for the Transvaal in Pretoria, and submitted to him a number of photographs and samples of wool from the best known South Australian flocks. He promised me that when the Administration decided to commence importing stud sheep South Australian flocks should be given a fair trial, as he was of opinion that probably the sheep from your State would be most suitable for the Transvaal, owing to their fine hardy constitutions. I brought to the Adviser's notice the sheep-proof fence patented by Mr. Peter Waite, and a trial fence is to be erected on one of the Government farms, and if it gives satisfaction a large order is likely to follow.

"The importation of cattle on any large scale is not likely to take place until the present epidemic of rinderpest dies out. This is now making its way right down through the country, and is causing heavy losses."

ROSEWORTHY AGRICULTURAL COLLEGE NOTES.

FARM.

Shearing.—The College flock has been shorn entirely by students, and the wool is in sacks awaiting advices from the Teacher of Woolclassing. The wool of last year's shearing is still on hand, and in the opinion of the Professor of Agriculture should be sold as soon as the Teacher of Woolclassing has finished with it.

The Crops.—A portion of field No. 7 sown to oats was ploughed early in September, and has been sown to sorghum and a variety of trial summer crops for forage. "Dahlitz," a 43-acre field sown to wheat for hay, has been ploughed, rolled, and scarified, and will be fallowed again for next season's crop. The growth on the portion of No. 7 has been cut with the mower and put into the silo: also small patches in Ebsary's A and C, where the weeds had the greater possession. Cutting of the hay crop will begin in earnest the coming week. The pit for the weighbridge has been dug and the wall erected for this improvement. It is hoped that the bridge will be completed in time to weigh the crops from the experimental plots this season.

Horses.—There are on the farm several aged horses and a few light roadsters which should be disposed of, and, if sold, should be replaced with a less number of good young farm horses. Nine mares are being bred this season—two to a thoroughbred and seven to a draught stallion. A good draught entire would be a valuable acquisition to the farm stock.

Water Supply.—The work on the Barossa water mains is progressing rapidly, and promises completion in the near future. Owing to the very dry season and the absence of any heavy showers whatever, the dams are nearly all dry and the cisterns and tanks hopelessly low. It seems desirable that the work of reticulating for College supply should be completed by the time the mains are completed, for surely the College will suffer for the want of suitable water for domestic purposes early in the summer if timely rains fail to provide the necessary supply.

EXPERIMENTAL VINEYARD.

BY H. E. LAFFER, SUPERINTENDENT OF VINEYARD.

Vines and fruit trees are now well forward, and on the whole look fairly well, considering the light rainfall. All varieties of vines show an abundance of fruit bunches, and many of the earlier varieties are beginning to burst into flower. Owing to the non-setting of Muscatels in previous years, we have this season tried the effect of ring barking and topping. This variety is about ready to flower, and should the experiment prove successful we may expect a fair crop of Muscatels. The same process will be carried out on the Zante and Cape currants in due time. Last year the currants treated set a very fair crop, whereas those not done had practically no fruit on them.

The strong growth being made by the manured vines points strongly to the benefit to be derived from the use of artificial fertilisers. At the same time there is no growth of weeds in the vineyard, the manures being too deep down to be reached by them. From general appearance the plot dressed with super and sulphate of ammonia is superior to the others, but the conclusive result can only be arrived at by taking the weight and conditions of the fruit when ripe.

In the orchard many of the peach trees are affected with black aphis. Mr. Quinn recently gave a demonstration in fumigation with hydrocyanic acid gas; but, owing to the tent not being airtight and unfavourable conditions, the operation was only partially successful. The tent has since been painted, and much better results are now looked for.

On the limestone soils apricot trees turn yellow in the foliage, and in about two seasons die out. We have this season tried to remedy this by giving each tree about 100 gallons of a 2 per cent. solution of sulphate of iron. The effect, if any, will be shown on the young growth, and careful observations will be taken, and the results recorded.

Thorough disbudding of water shoots on vines has taken up much time during the present month, and already most of the vineyard has been done twice. The rainfall for the month has been 1.05 inches. This has kept the surface moist and all foliage fresh. Scarifying, when necessary, has been done to keep the surface loose, and hand hoes have been busy removing those weeds out of reach of the implements.

NOTES ON VEGETABLE GROWING FOR NOVEMBER.

By Geo. Quinn, Horticultural Instructor.

The object of these notes is not to teach the practical professional gardener how to carry on his business, as business management is largely the result of experience, intelligence, and commonsense combined. They are written chiefly with a view to reminding the farmer and other producers who possess a vegetable garden that the season has arrived for preparing or setting out such crops as may be grown by any person with a little time, energy, and water for irrigation purposes. The methods advocated are the results of the writer's observation amongst thoroughly practical men, and personal experiences and practice.

Successional sowings of so-called French beans (dwarf or runner), according to the position and facilities of the grower, should be made about every four weeks. By this means a supply of pods are made available right throughout the summer. The germinating stemlets of these plants are very brittle, and if much obstruction is opposed to their progress when ascending through to the light the plants will be ruined. The Chinese gardener sows the seeds and covers them with broken manure, so that they meet practically no resistance when emerging through the surface. These plants are very susceptible to damage from the buffetings of the wind, consequently require good shelter. A few rows of maize planted not less than 3 or 4 ft. from the nearest row of beans, and forced with water, soon make a good shelter in this respect, and the cobs are good for poultry. If the soil be dry it is a good plan to soak it well a few days before sowing the beans. The bean seeds should be soaked for a few hours in water prior to planting. This is done by pouring water not quite boiling over them, and allowing them to remain in it. If treated in this manner and sown in good damp soil, and covered with loose, broken manure for about an inch in depth, they should germinate and appear above ground before it is necessary to apply water again to the soil. They like fairly rich soil, and phosphatic manures—fine bonedust or superphosphate —prove very beneficial.

Melons of various kinds may yet be sown with fair hopes of successful results. A similar mulching to that advocated for beans should be appl'ed above these seeds when sown. If the ground is lacking organic matter good rotted vegetable substances or farmyard manure should be worked into the soil prior to sowing the seeds. The remarks respecting watering before preparation also apply to these.

Sowings of red and silver beets may also be successful if made now. The former is a very wholesome vegetable to use in hot weather as a relish to cold meat dishes, and the latter makes a capital substitute for spinach, as with plenty of water it grows freely during hot weather.

Plants of tomatoes, chillies, and egg fruits may still be set out. A mulch of manure and a good soaking are necessary assistants on transplanting. Although tomatoes are fairly gross feeding plants, it is not wise, if early fruits are desired, to give them too much water or stimulating manure after they have made a good start. The principle which holds good in all fruiting plants that great vigour of vegetation is not conducive to the setting of large crops of fruits applies to these particularly. As soon as they begin to flower freely reduce the water for a time, and if possible open the plants to the light. After a fair number of fruits are set upon the plants the watering may be resumed, and applications of superphosphate will improve the results in most cases.

Onions and potatoes need harvesting carefully. The former readily scald if left on the field in the sun, and if handled roughly are bruised and soon decay. A cool dry shed is a suitable storehouse for them. If potatoes are not dug when ripe in the spring as a rule the potato moth gets a start among them, and soon sets up much destruction.

Asparagus beds should receive liberal attention while the plants are growing freely. Plenty of water and manure will make strong plants before they sink to rest, and when these start to shoot next year much more can be cut from them than from spindly starved specimens. This vegetable should be grown in every garden, as much more can be cut from it than is usually thought by those who only consume the blanched shoots.

Rhubarb plants now require a good mulch of manure or broken vegetable matter. A good dressing of rich stable manure put on and then thoroughly washed in by a soaking will stimulate the plants very much, but it should not be piled against the leaf stalks unnecessarily. I am assured by competent commercial growers of rhubarb that bonedust is an excellent manure for this plant.

If cool shaded spots are available salad plants, such as radishes, cress, and lettuce, may be grown with fair success during the summer months. The latter should be sown in the bed and thinned out, not transplanted. Hearts will not be formed readily in dry localities, so the outer leaves should be used in the young crisp stage.

The chief work in the vegetable garden will now consist of watering the plants. Wherever practicable the whole surface of the beds should be covered with a mulch of manure. Failing this the surface should be constantly pulverized. If overhead watering is resorted to, as soon as the surface is dry enough it should be broken up with fork or hoe, and not allowed to gape into cracks which allow moisture to escape almost to a visible degree. It is simply astonishing how the supply of water can be saved if this practice be persisted in. Cucumbers and melons like overhead watering, particularly when the sun is not shining upon their leaves. A gentle, constant dripping from a leaking pipe or hose will work wonders on an adjacent patch of cucumbers.

As any kind of seeds ripen gather them carefully into sound bags and drop a label into each, because before the time to sow them comes around again the memory often fails to distinguish between various kinds.

ORCHARD NOTES FOR NOVEMBER.

By Geo. Quinn, Horticultural Instructor.

In all fruitgrowing areas of the State there is shortage in the rainfall up to date. This means we must try to make the best use of what has fallen into the soil. The only practicable method open to the average grower is to conserve it by cultivation. This is most effectively done by stirring and pulverizing the whole surface of the orchard as often as practicable. There is no need to enter into explanations or arguments respecting the value of this practice in retarding the evaporation of moisture into the air—that is established beyond doubt. The whole of the surface of the ground should be thus treated, because although not generally taken into consideration hard, uncultivated, or poorly pulverized patches will attract moisture from beneath the cultivated part near by, and pass it off into the atmosphere. This is due to the fact that capillary moisture is not under the direct influence of gravitation, and consequently will pass laterally through the soil. Where the orchard is extensive an effort should be made to secure cultivating implements which will enable the grower to pass all over the area in as short a time as possible. This assists vastly in readjusting the fine soil mulch after summer showers. It is not that delayed cultivation may cause the loss alone of the moisture precipitated by such showers, but the surface being consolidated a capillary connection between the subsoil moisture and the air is formed immediately, and loss of some of this moisture will also take place.

Where the stocks are available, whether of young seedlings or old trees of undesirable kinds, the budding of citrus trees may be undertaken. Now that the fruiting superiority of the Washington Navel is proved locally it is a wonder more of the rank-growing, sparsely fruiting Australian navels are not budded over. In California hundreds of acres of seedlings of great size are now worked to this variety. The method adopted is to insert the buds in the reversed T fashion, and bind them with waxed cloths as we do in scion grafting. These buds are inserted into the thick main arms direct, at a point near to the junction with the main stem. After the buds have united the tops are either removed wholly or partially, and the stems and stumps receive a thick coat of whitewash, and if growing in very hot exposed positions they are bound around with straw protectors to avoid sun scald until the foliage forms sufficient shelter. Trees dealt with in this fashion should receive good treatment in the direction of manuring and water prior to being operated upon, and plenty of water as soon as the buds have "taken." In fact, every inducement must be given to enable the inserted buds to produce a normal head of branches and leaves as soon as possible.

Grafts need careful watching to avoid blowing off or being overgrown by rank shoots from their stocks. See that old large wounds of amputation are covered from the sun. Clay, wax, or paint will do for this purpose. Bark or rind grafts usually run more risks of being blown out than others if left unsupported. To prevent growths on pear grafts becoming topheavy and pendulous pinch out the terminal bud from time to time. If the stock has been large, with a healthy root system, treat the shoots arising from below the scions similarly in preference to rubbing them away altogether at this stage.

Newly planted trees require constant attention if shapely, well-balanced specimens are to be grown. The rank shoot which outstrips its competitors needs the sappy terminal bud removing to give a temporary check to it, and where too many shoots are emerging a judicious thinning will tend to the ultimate benefit of the tree. Trees at a fruitbearing age, more particularly of the peach, need attention now to regulate their annual wood. Very frequently the base buds emerge in great numbers of shoots, and these should be thinned by rubbing some off altogether.

Annual growths of the peach left at the winter pruning for fruitbearing purposes may have failed to set fruits. On these, as a rule, many shoots are arising. Such barren wood should be cut off down to young shoots near its base. These may appear weakly now, but the removal of the upper portion usually throws much energy into them with good results. Other such shoots may have set a fruit or two nearer to their bases, and these should be shortened back to the young twig which accompanies or arises immediately above the topmost fruit.

The thinning of peach and apricot fruits is usually performed after the natural drop of improperly formed fruits, takes place, and before the "stones" harden. In many places apricots are very thick upon the trees, and likewise some varieties of peaches. By judicious thinning a finer sample is secured, the tree relieved of a drain upon its energies, and the marketable value of the product increased. Chemists assure us that the "stones" of these fruits draw much more heavily in proportion upon the more essential plant food elements in the soil than does the pulpy mass. Practical tests show conclusively that by reducing the number of fruits this drain can be minimised. There is no rule by which the exact number of fruits to leave on a tree can be ascertained. The general health and chances of nourishment alone can guide one in this work. It is true the fruits must have space to allow them to expand to a normal size, but this usually should not be slavishly followed as a maximum of the needs to be kept in mind.

In dry localities young trees should not be allowed to hold out signs of distress for want of moisture—that is, if water for irrigation is available. The roots of such trees should be encouraged to penetrate deeply and establish themselves in cool soil so as to resist the summer's heat. This cannot be attained so effectively by a lot of surface mulching and surface watering as by opening deep furrows or rings and putting the water down into the soil, providing proper cultivation be given as soon as the soil is workable to retain it there.

The watering of citrus trees becomes a vexed question at this period of the year, when the young fruits are setting. The inevitable result—if the trees have become dry to the suffering stage—is to shed large quantities of the fruits and start into fresh growth. Growers should endeavour to maintain an even supply of moisture around the roots, thus averting spasmodic growths succeeded by checks. Citrus trees are transplanted throughout the summer by careful men when water is available for irrigation. At this period a good ball of undisturbed earth around the roots is desirable, but the tops must be shortened back considerably, and a good soaking of water applied as soon as the tree is planted.

Aphides have been very troublesome on most trees. The peach, pear, and orange trees have been badly attacked. The small hymenopterus parasite which usually comes on the scene in the late spring works havoc among these pests. Unfortunately, it arrives too late to save the foliage and shoots from great damage. It appears as if most of these little wasps must perish during the winter, as they are not sufficiently numerous until late spring to make any impression on the aphides. Recognising their presence and value, many persons fear by spraying the aphides they will kill these parasitic assistants. When the parasite is developed to the larval form within the body of the aphide it (the aphide) looks roundly bloated, and crawls apart from its companions prior to perishing. With a view to testing the matter, I sprayed the leaves of a peach tree showing many parasited aphides with tobacco and soap wash sufficiently strong to kill the aphides in all stages. Leaves were then gathered and dipped in more of the solution. These leaves were then enclosed with cotton wool in a glass test tube, and placed in a shadehouse for ready observation. The parasitic wasps emerged in great numbers in due time, showing, that when partly developed they matured safely inside of the sprayed bodies of the aphides.

The campaign against codlin moth should be prosecuted with energy now. In the presence of much loss at the end of the fruit season many growers avow their intention to go in "for spraying next year," but when the time comes and the wealth of bloom gives way to the setting of fruits, the grower too often puts off the spraying, and allows the time to go by until once more this insidious foe claims the harvest. The season is proving favourable for the development of the Fusicladium on the apples and pears, and the use of Bordeaux mixture combined with arsenites when spraying for codlin moth is recommended. In a separate article (see report of Forest Range Conference of Agricultural Bureaux) this matter is dealt with in detail.

Broken Winded Horses.—"I wonder," says a writer in an American paper, "whether any one has had a broken winded horse or mare which has recovered? I have an aged mare which, five or six years ago, was so 'gone' in the wind that, after a trot in harness of two or three miles, she was in a hopeless state of collapse; she coughed violently, and her sides heaved with the peculiar double blowing indicative of the disease. After a continual treatment on specially prepared diet, consisting of chopped hay, crushed oats and bran, given well damped with water, and no long hay, she has lost all her cough, and there is no appearance of distress from the heaving of the flanks. She can trot along quite comfortably, and do eight or ten miles as easily as any other animal of her age. I merely give the facts of this particular case, which prove conclusively what can be done for a broken winded horse by judicious feeding, if the disease itself may not be entirely cured."

MANURING APRICOTS IN DRY DISTRICTS.

In the December, 1900, issue of The Journal of Agriculture we published an article by Mr. E. M. Sage, of the Pinery, dealing with the complaint of apricot trees known as "die-back." This trouble is very frequent in our dry district, trees six to eight years old showing signs of dying back from the ends of the limbs, and in a few years' time the tree succumbs. Mr. Sage tried the effect of manuring with superphosphate after cutting the trees hard back, and in the Journal we published illustrations showing the marked results obtained. Mr. Sage has now furnished further information concerning later developments in his garden.

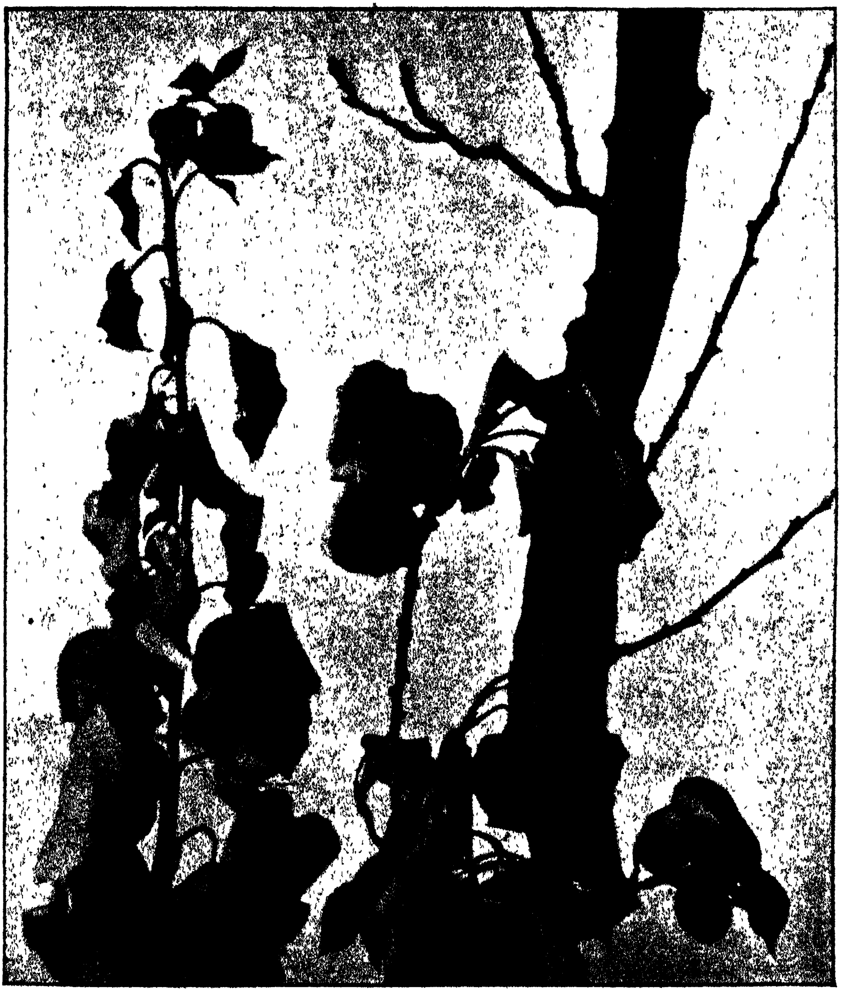
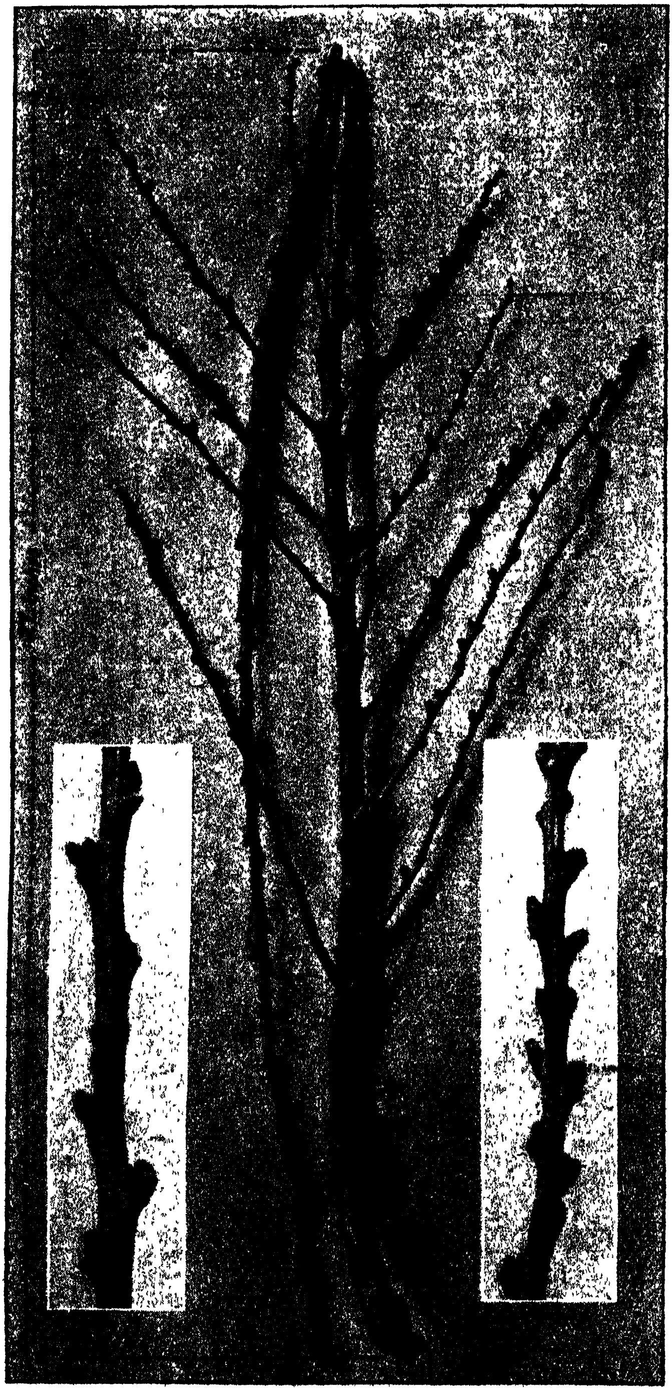
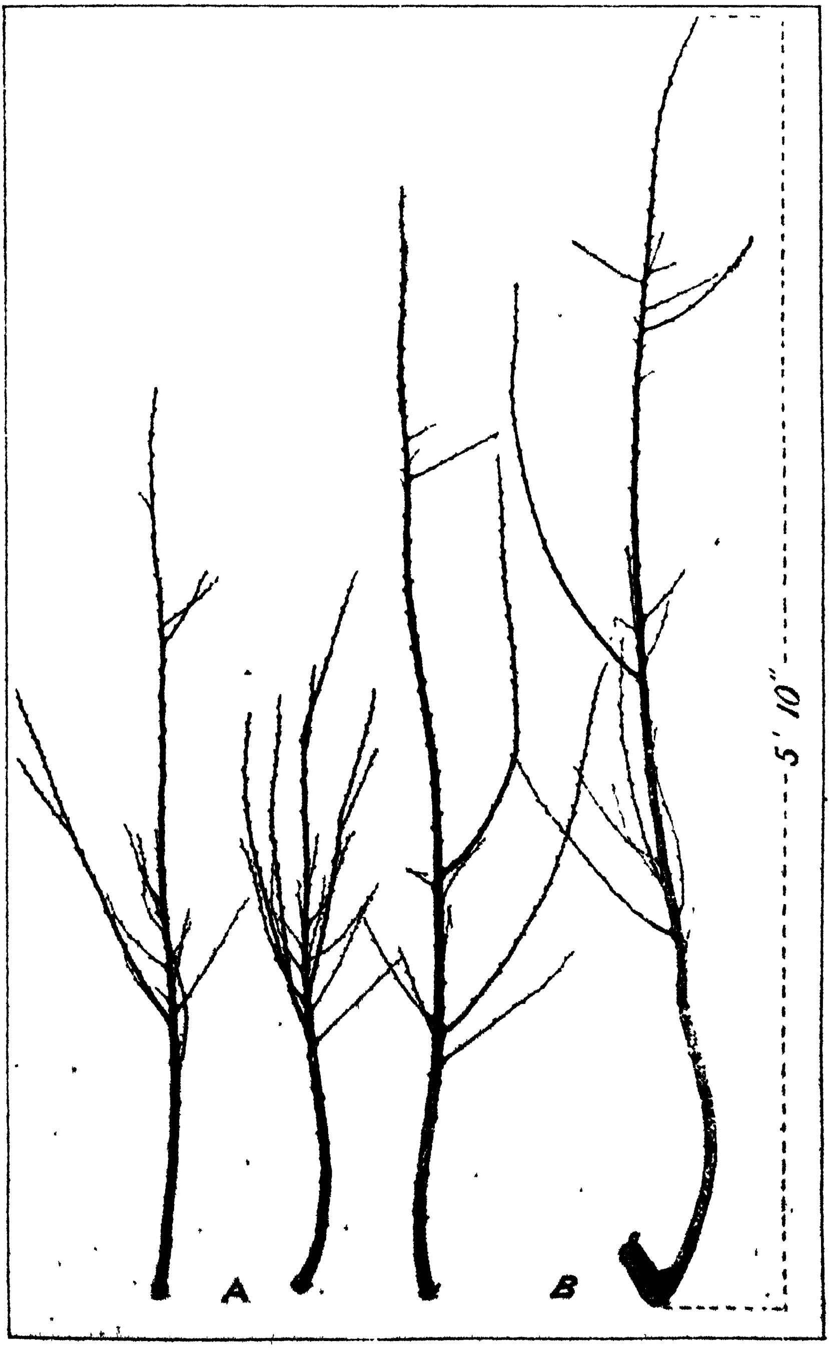


FIG. 1. FIG. 2.

Fig. 1 is the new growth from Apricot Tree cut back and manured three years previously. Fig. 2 shows one-year-old wood and new growth on unmanured tree in same orchard.



One year's growth from manured Apricot Tree, with enlargement of laterals showing development of buds.



A. Year's growths from Moorpark tree five years after manuring.
B. Year's growths from Oullins Early Apricot two years after treatment.

The first illustration is from a photograph taken nearly two years ago, showing two seasons' growth on an unmanured tree, as well as growth taken from a tree manured with bone super three years previously. The second illustration shows one year's growth of wood from this tree. The manure used was rather coarse, and the season being dry, the results the first year were not very marked; but, as the illustrations show, it has had a lasting effect. Figure 1 on the third illustration shows one year's growth from the same tree the fifth season after the application of the manure. As will be seen, the tree is still making strong, healthy growth, and there is promise of a heavy crop of fruit. Figure 2 in the same plate illustrates a year's growth from an Oullins Early Apricot tree in the same garden that received mineral super two years back, at the rate of 3 cwt. per acre. This tree was headed back prior to being manured, and is 11 years old. It was making very poor growth prior to this treatment, but is now vigorous and fruitful.

Oullins Early and Newcastle Early varieties appear to stand better than the Moorpark in the dry areas. Mr. Sage states that on these light soils he finds that almost invariably the mature growths of any size at all are quite hollow, or the centre is soft and pithy, and some of the trees he has headed back in his garden have commenced to decay from the centre. He is disposed to think that, owing to a deficiency of some constituent in the soil, the trees fail to mature healthy heartwood. From the results of his experiments with superphosphate a deficiency of phosphoric acid would seem to be the cause.

IRRIGATION AND STATESMANSHIP.

By the passing of what is termed "The National Irrigation Act" the Federal Parliament of the United States of America can claim credit for dealing with the question of irrigation in a statesmanlike manner and on a scale which can scarcely be equalled in any country of the world, past or present.

The Act in question, which received the President's signature and became law on June 17, 1902, provides that the money received from the sale and disposal of public lands in what are known as the arid and semi- arid land of the Western States and Territories shall be devoted to the construction of irrigation works for the storage, diversion, and development of waters in the said States. The Act is retrospective to July 1, 1900, and there is now in the Public Treasury the sum of $6,000,000 available for this "reclamation fund," as it is appropriately called. The moneys received from the sales of public lands in these States is to be added each year to this fund, and it is estimated that the annual receipts from this source will be $2,500,000.

To secure the proper utilization of the available sources of water, the Act provides that the Secretary of the Interior shall cause examinations and surveys to be made, and shall report to Congress annually on the practicability of each irrigation project. He is authorized to use the fund for the construction and maintenance of reservoirs and irrigation works, and to make such charges upon the lands served by these works as will return the outlay to the fund in 10 annual instalments, without interest or profit to the Government. As these amounts are repaid by the settlers, they will be credited to the reclamation fund, which in the course of years will assume very large proportions. It is estimated that during the first 10 years there will be $25,000,000 received from the sales of lands, and that during the second 10 years settlers on the reclaimed lands will be paying back their instalments, thus giving a total of $50,000,000 for investment in new works during that period. Each year, of course, this will be added to. After the available land has been reclaimed these moneys will be returned to the Government, as the Act specially provides that the settlers on these reclaimed areas must pay their annual instalments before they are entitled to the fee-simple of their land.

The area of arid lands comprised in the States and Territories referred to in the Act is estimated at 600,000,000 acres, of which it is believed that from 60,000,000 to 100,000,000 can be reclaimed at an average cost of $10 per acre;

so that it will be seen that the United States is dealing with an immensely great question, that every penny of the moneys earmarked for the purpose will be required for many years, and that some day there will be an amount calculated in hundreds of millions of dollars to replenish or fill to overflowing the coffers of the Federal Treasury. The Act specially provides that so far as the same may be practicable, and subject to the existence of feasible irrigation projects, the major portion of the funds arising from the sale of lands in any State shall be expended within the boundaries of such State. Until the payments required by the Act are made for the major portion of the lands irrigated from the works of any particular system, the management remains under Government control, but when these amounts have been paid the control is to pass to the owners of the lands irrigated; but the title and control of the reservoirs remain in the Government until otherwise decided by Congress.

MANURING OF GRASS LAND.

By W. L Summers, Inspector of Fertilisers.

In previous Journals reference has been made to the experiments in the manuring of grass land being carried out in various parts by members of the Agricultural Bureau. Owing to the extreme dryness of the season, I regret to say that several of those undertaking these experiments report that there is so little grass on the land that it is impossible to make any comparison between the plots. Similar conditions exist in respect to the growth on the plots on which experiments were carried out last year with manures supplied by Mr. F. H. Snow, of Adelaide. I had hoped in connection with these latter tests to have secured some information as to the comparative yields the second year from super and Thomas Phosphate respectively; but only in one or two instances is any report available. So far as can be judged from these reports the result in the grass appears to coincide with the result in the wheat yield. Where superphosphate gave higher returns in the crop than Thomas Phosphate there is also more growth of grass; while, on the other hand, where the latter manure paid best with wheat the growth the second year is also better.

On August 23 I visited Mr. T. Pengilly's farm, near Aldinga, in company with the members of the Willunga Agricultural Bureau, to inspect grass plots manured with different fertilisers, supplied by the department. The land selected for the tests has been out of crop for 15 years, and is on the lower slope of a hill facing north. Each plot is two acres in area, with strips of unmanured land 36 ft. wide between. The manures were distributed about the first week in June by means of a seed and fertiliser drill, with the hoes raised 6 in. from the ground, and a fairly strong north-west wind blowing across the plots assisted in securing an even distribution of the manure as it fell from the hoes. A steady, soaking rain fell almost directly afterwards, rendering harrowing quite unnecessary. Mr. Pengilly states that within three weeks the effect of the manures was plainly noticeable, both in colour and growth of the grass. When we inspected the plots they afforded most convincing evidence that the application of manure under local conditions was profitable. The following table gives the constituents and cost of the manures applied:—

No. of Plot	Manure Applied.	Quantity per acre.	Cost per acre.		ANALYSIS.			
					Total Phosp'te.	Water Soluble Phosp'te.	Potash.	Nitrogen
		cwt.	s.	d.	Percent.	Per cent.	Percent.	Per cent.
1	Grass Manure A	1	4	9	30	16	2.25	1.2
2	Bonedust & Mineral Super Mixed	1	4	10	45	25	—	1.6
3	Bone Super	1	5	3	36	16	—	2.5
4	Grass Manure	1	4	6	32	16	1.6	1.3
5	Thomas Phosphate	1½	4	6	39	—	—	—

Plot 1 was the best of all, the grass being strong and healthy. Where clovers existed on the lower parts they had made splendid growth. It was unanimously agreed that the unmanured strips alongside did not carry a fifth of the growth of this plot. Plot No. 2 was not quite so good as No. 1, but the growth here was also very satisfactory. Plots 3 and 4 were about equal, but neither carried as much grass as 1 or 2. The manure applied to Plot 4 is that placed on the market by the Adelaide Chemical Works, and only differs from "Grass Manure A" in that the latter had more potash added to it when being bagged. Plot No. 5, which received 1¼ cwt. Thomas Phosphate, was more backward than the other plots, doubtless due to the manure being less soluble. The growth on the plot was, however, much greater than on the unmanured land, the general opinion being that it would carry three times as much stock. In every case it was noticed that the grass was of much brighter colour on the manured plots. Another point worth noting was that the procumbent geranium, which on the unmanured plots was so flat and close to the soil that it hardly afforded a bite for stock, was larger and more upright on the manured land. The effect of the manure on the clovers was also very noticeable. So far as could be judged from a single experiment the presence of potash is having a good effect on the grass, and it will certainly be worth testing next year whether it will not be profitable to apply a manure containing up to 4 per cent. of potash, even if it is necessary to reduce the quantity of phosphoric acid. All the visitors were satisfied that the manuring of grass land was worthy of greater attention, and several stated their intention of carrying out experiments themselves next year. The week following the visit Mr. Pengilly put seven horses and two cows on the land, and he states that he has on no occasion observed any of them feeding on the unmanured land.

Mr. W. Bowey, of Maitland, reports, on September 6, that he was afraid the results did not warrant the expenditure, although the growth another season may show more favourably. Maitland soils, being naturally fertile, always produce good grass when the season is favourable, and the manures are subjected to a severer test than on poorer land. In the early part of the season the manured plots came on well, and he expected much better results than were obtained. The growth was earlier, and the wild oats, &c., came into head earlier than on the unmanured land; but when fed down there was no noticeable difference on the plots, showing that there had not been much increase in the undergrowth. Two of the plots receiving grass manure were duplicated. In the second the manure was distributed with the hoes lightly down. Here the results were more marked than when the manure was distributed on the surface. In his opinion the best results were given by the plots receiving the mixtures branded "grass manure." It was very noticeable that when stock were placed on the land they fed mostly on the manured plots, almost neglecting the grass on the unmanured land at first. The animals did remarkably well while in the paddock. In dealing with these results there are several points that must be borne in mind. First, these manures are expected to show in the grass for three or four years at least, and if they return a profit the first year they should prove very profitable in the long run. Then we have Mr. Bowey's statement that the grass came on quicker earlier in the season. This alone is worth something, especially where sheep are kept. And, finally, we again have the cattle testifying in unmistakable language that the quality of the pasturage is improved.

Mr. H. A. Hussey, of Riverton, states that after the first rains, which were moderately soaking, the manured plots came right away from the unmanured land, the lines between being as distinct as a road. The grass on the manured land was healthier and fresher in colour. In places where the drill stopped to refill the grass assumed a yellow appearance later on, probably owing to the manure going on too heavily. The experiments were undoubtedly a success, the manured plots carrying one and a half times to twice as much as the unmanured strips between. Up to September 22 there was not much difference in the grass on the different plots receiving manure, but Grass Manure A was the best. This might, however, be due to the land being better. The land has not been broken up for years, and has been consistently fed down, with the result that the pasture is scanty. Mr. John McKenzie, of Riverton, also carried out tests with manures for grasses. He states that while Thomas Phosphate improved the quantity of grass somewhat the results are not sufficient to pay for the expense. Bone super, on the other hand, has caused a marked increase in the feed. The herbage started to grow from the first, and was considerably ahead of the unmanured land. Mr. T. Gravestock, who inspected the plots, reports that he is of opinion that the result from the super is profitable. It will be again noted that in both these cases, not only was there more grass on the manured land, but it was earlier than where no manure was applied.

Messrs. W. M. Shannon, of Bagot's Well; J. Cheriton, of Strathalbyn; S. Tavender, of Lucindale; and F. L. Ifould, of Onetree Hill, report generally that, owing to the very dry season, no satisfactory conclusions can be arrived at as to whether the manures will pay to use on the pasture land. Mr. H. A. Giles, Mount Pleasant, applied the manure to a paddock, which he intends to cut for grass hay. Through various causes it was not applied until July 21, and, although favourable weather followed, it was not possible to detect any real difference between the manured and unmanured plots on October 10, when the members of the Mount Pleasant Bureau paid a visit of inspection, although generally there appeared to be a little more undergrowth on the manured land. I am disposed to attribute this want of result entirely to the late application of the manure. In my opinion it should be incorporated with the surface soil before the grass has well started. In each of these instances the manures were supplied by the department, and were the same as used by Mr. Pengilly.

Quite a number of farmers are this year testing the manuring of pasture land for themselves, and while, owing to the season, there have been a good many apparent failures, in the majority of cases the manure has had a marked effect. It must, of course, be remembered that the effect of these manures will probably be seen for several years; hence the want of result the first year, through unfavourable conditions, should not cause landholders to condemn the practice. From what I have seen of the results generally I am convinced that in a few years the direct application of commercial fertilisers to grass land will account for many hundreds of tons of manure annually.

FARM HINTS FOR NOVEMBER.

By A. Molineux

Finish haymaking and stacking as soon as possible. The sooner the stacks are thatched, or otherwise protected against heavy rain, the safer will they be against damage. Have sufficient dunnage beneath the stacks to prevent damage from water beneath, and do not build on low ground where water would collect after a storm; nor in an awkward corner, where wagons cannot be readily moved about. It is not wise to build too large stacks, nor to crowd them together where an accidental fire might destroy the whole lot. Stacks should be protected against trespass by stock. If fowls are about they can be prevented getting on the stacks by driving in a few short stakes along the eaves, and affixing three fine wires at 8 in. apart. The birds may try to fly on to the stacks, but the wires will throw them back.

Try the following experiment:—Cut an acre or two of crop intended for feeding purposes, and chaff into a pit for ensilage. Cut an equal area of crop of equal quality and make hay of it. Then feed the hay to a couple of cows. When the hay is finished, feed the same cows upon the silage. See how long the hay will keep the cows, then take note of the time they will take to eat the silage. Note the quantity of milk given by the cows, the weight of butter made from the cream, and the health and general condition of the animals during each period. It will be discovered that the ensilage will last much longer than the hay, although there was quite as much original green stuff as in the silage; the cows will be healthier and more contented, and the butter will be greater in quantity per week and better in colour than when fed on the hay. Surely, in the face of assertions made by thousands of people who regularly practise ensilage in other parts of the world it is irrational to neglect a trial of the system.

The grain of wheat that is reaped when in the advanced dough stage is plumper, has less bran, more flour and gluten, is brighter, and altogether a better sample than that which is left of the same crop until it is dead ripe and fit for stripping. The straw from the stripped crop is of much less nutritive value than that which was reaped earlier. The field of the reaped crop can be harrowed at once, and any rain that may fall will sink into the ground and remain there whilst the surface is loose; any seeds of weeds will probably sprout and furnish an early bite for stock, and the ground will be more easily ploughed than that on which the stubbles were left. The stringbinder can be used when the stripper is unable to take off the crop, can go in early and continue late in the day, and where there is no straw on the field there is not much to fear from stubble fires. Any farmer who has a hundred tons of straw in stack need not dread to keep more stock on his land than he would be justified in keeping when he has to depend upon the natural herbage for the maintenance of their lives. I have never known a farmer to have been injured through having a large stack of good straw to fall back upon in times of drought; but there have been occasions when the fortunate possessor of a straw stack has benefited therefrom.

If the hay or the wheat is reaped and bound, and the harrows run over the field, it will be worth while to scatter 3 or 4 lb. per acre of rape seed before harrowing. The plants will come up if any rain should fall, and there will be a nice green bite for the stock.

Just before hay and wheat harvest commences the dilatory farmers rush their harvesting implements off to the smith and wheelwright for repairs; then they blame everything and everybody if their crops suffer through standing too long in the field. Surely the smith and wheelwright could do better work and cheaper if they had the implements much sooner.

Everybody is too busy now to start erecting shelters for their stock, but the animals suffer very severely from exposure to the fierce heat of some of our hottest days. If the owners were chained out in a bare field for half a day only when the sun heat ranges about 140 deg., with not a drink of water, it is probable they would start making shelters, even if the crops were left standing whilst they did so.

Malting barley should be reaped with the binder directly it is fully ripe, and should be stacked and thatched as quickly as possible, because the least damp causes discolouration of the sample. Cape barley for feeding purposes can be stripped if the beaters are slightly raised by placing a piece of raw hide or bacon rind around the spindle ends, and wrapping the beaters with green hide. It is more economical, however, to reap and bind the crop, because the straw is useful for feeding stock.

Maize and sorghum may still be sown in some places. The land should be well prepared, the seed sown with a drill, rolled after, and frequently cultivated whilst growing. It is next to useless to sow these summer crops broadcast.

Those who have crops of peas growing should ascertain how they are harvested around Gumeracha, where they use an improved pea harvester. This is a very valuable crop to grow for use on the farm. It not only improves the land for future cereal crops, but it supports pigs, fowls, sheep, cows, and horses.

Shearing is generally done early to avoid the grass seeds getting into the fleece; but where there are only a few sheep to deal with it might be better for the animals and for the owner to delay shearing for a week or two, so that warmer nights may be experienced. Late frosts sometimes kill early shorn sheep. Anything of a vegetable nature mixed with the wool detracts from its value; therefore care must be taken to have no chips, chaff, straw, or string about the floors when shearing. There is no necessity for tying the fleeces, but if they must be tied use worsted.

It is a disputed point as to whether removal of some of the leaves of beets and mangolds has any injurious effect upon the bulbs—the presumption is that it is injurious to some extent—but if any are used for feeding stock, take only the bottom leaves, and feed only lightly at first, because they have a scouring effect. Mustard has the contrary action.

Some people say that it does not pay to grow vegetables and fruit, or to devote time to cows, poultry, and pigs, because the time so lost could be more profitably devoted to rearing sheep and horses, and growing wheat and hay crops. That is all very good for a man who does not want to grow vegetables, &c.; but if he did not have to buy all those articles, but could have them fresh every day close at hand, would he not be better off, and could he not easily give a few minutes each day to the recreation of cultivating vegetables and fruit, and the feeding of cows and fowls, without interfering in the slightest with his other work? What would it cost per year to provide a farmhouse and 10 people with eggs, butter, vegetables, bacon, and fruit? There is health and profit and comfort in the production of such articles in abundance on any farm, and there are very few farms, if any, where something at least cannot be done in this direction.

The broadleaf mustard, the sand lucerne, and the French honeysuckle (called also "sulla," "Malta clover," and botanically Hedysarum coronarium), which I distributed through the medium of the Agricultural Bureau some years ago, were pronounced to be splendid fodder plants, especially on light sandy soils. Has any farmer continued to sow the seeds, or could we now find one quarter of an acre of either in the whole State of South Australia?

ON THE POISONOUS NATURE OF IMMATURE SORGHUM PLANTS.

By Arthur J. Perkins, Secretary for Agriculture.

On various occasions in this State death of stock pastured on immature sorghum has been brought under the notice of the Department, but no satisfactory explanation of the phenomenon had as yet been brought forward. Some maintained—without definite proof, however—that the undeveloped leaves contained a poisonous principle, whilst others professed to see in it a modified form of "hoven," or stated that probably the stock was removed from dry feed to the succulent sorghum too abruptly; that it took to it too greedily, and suffered accordingly. Doubtless in some cases the latter explanation may have been correct; but it has failed to provide a satisfactory answer to all cases that have arisen from time to time. The same kind of accidents appear to have been of frequent occurrence in Egypt, and have latterly received the attention of Messrs. W. R. Dunstan, M.A., F.R.S., Director of the Scientific Department of the Imperial Institute, and T. A. Henry, D.Sc.. Their investigations were summarized in a paper read before the Royal Society of London on May 15, 1902, the main points of which I am able, through the courtesy of Sir Charles Todd, to quote here.

They had occasion to examine specially the plant known as Sorghum vulgare, the Great Millet or Guinea Corn (Dhurra shirshabi of Egypt). The authors show that the young plants but not the seeds or old plants, when crushed with water yield prussic acid (about 0.2 per cent. of the dried plant). The acid is not found in the plant in the free state, but developed by the action of a special enzyme from a cyanogenetic glucoside, which has been named "dhurrin." No physiological tests have been made with a view of proving the action of the poison in animals; but in face of what experience has taught us it seems probable that prussic acid may be set free in the digestive organs of animals consuming young sorghum plants, resulting frequently in their death. The authors are further investigating the various points of interest concerned in their discoveries. It is satisfactory at all events to note the disappearance of the poisonous compound from the mature plant.

The authors draw attention to the presence of prussic acid in several other plants, notably Lotus arabicus, Manihot utilissima, Linum usitatissimum, Lotus Australis, and Phaseolus lunatus.

POULTRY NOTES.

By D. F. Laurie.

By the time this appears in print I shall have finished a course of 12 lectures, delivered at the School of Mines, Adelaide. The attendance was moderate, but it was a pleasure to deal with earnest enquirers after knowledge.

I have received a very large number of letters this season enquiring for poultry, and have been instrumental in sending away a good number, including some fine stock. The bad times rendered prices low, and breeders were loth to sell. My own spare stock went in a twinkling, and eggs as fast as hens could lay, and in the majority of cases with excellent results. The gradual improvement of poultry will mean a great increase in returns. I have word from my old friend Mr. W. L. Rae, formerly Poultry Editor of "The Australasian." He is now resident in England, and is Editor of "Our Home Pets," a monthly publication which pays attention to poultry matters. Mr. Rae purchases poultry for Australian buyers, and will obtain requisites, literature, &c., relating to poultry, pigeons, dogs, &c. I can most thoroughly recommend him to all my readers. He is very prompt to reply, and charges a moderate commission only. His address is W. L. Rae, "Our Home Pets" Office, 6, Snow Hill, London, E.C. The average cost of shipping and packing a bird to Australia is £1. I hope readers will import some good ones, and I shall be glad to advise on the subject.

A POULTRY MANUAL.

By D F Laurie

[Four or five years ago the department issued a bulletin on "Poultry Breeding," prepared by Mr. D. F. Laurie. All these have been distributed, and in response to frequently expressed desires for a revised and enlarged edition, dealing also with diseases of poultry, Mr. Laurie has consented to prepare the same. The articles will be published first in the journal from month to month, and afterwards reprinted in pamphlet form.—Editor.]

(Continued from October issue.)

Hatching.

Artificial hatching, by aid of incubators, has become a necessity, and, even those breeders who only hatch a few birds for showing find it necessary where early birds are required. The old prejudice against incubators is dying out, and before long we shall hear no more of the alleged inferiority of artificially hatched stock. As a matter of fact, stock hatched in properly designed incubators and reared on a sensible plan are in many ways better than when hatched in the natural way, and allowed to remain with the hens. Much that appears under "natural hatching" applies to the incubator. I have heard curious statements of late on the subject, and unfortunately some are in print, but I do not feel called upon to deal with the matter here. I recommend my own design of incubator as far the best of any I have seen, and I have used a great many. Hearson's machine and some Australian copies of the same are also excellent, but not so reliable, unless placed in a good cellar. Some American machines are good, others have proved failures, and have been discarded by many breeders in the other States. A great many incubators I have seen are faulty in design and construction. For the incubator select eggs of normal size. Very large or very small eggs should be discarded. This does not, of course, mean that the eggs of hens which habitually lay large or small eggs, as the case may be, should be discarded. Rough-shelled or mis-shapen eggs are not likely to contain strong germs, even if fertile. Where very large eggs, such as Minorcas lay, and small ones such as some of the Hamburghs lay, are to be hatched, it may be necessary to raise the smaller eggs to the same level as the large ones; otherwise, in the case of all machines in which the source of heat is over the eggs, the small eggs, being farther away, will receive less heat than the larger ones. Where possible select fresh eggs; say, within a week from date of laying. Such eggs will contain stronger germs and produce sturdier chicks, &c. Where a hen steals her nest she sits on the eggs for a time each day, and in so doing without doubt imparts vigour to the germ, which is not the case where eggs are collected and stand for a week or so. Where eggs, a fortnight or a month old even, are to be hatched, it will be necessary to start at a temperature of 90 degrees, and during two days gradually bring the heat up to 101 or 102 degrees, registered by a tested thermometer in contact with the eggs at their upper surface. It is preferable to hatch hens' eggs alone, or ducks' eggs, and not to mix them, although it may be done. Duck and goose eggs should have more moisture in the egg drawer than is advisable with hen and turkey eggs. Put as many eggs in the drawer as you can pack, so as to allow for the usual percentage of infertile eggs later on. There is no necessity to separate the eggs; they may be quite closely packed. On no account place any eggs above those in the drawer; they will receive several degrees more heat. Mark each egg with a distinctive mark, such as a cross or a letter; and use a soft pencil—this aids in turning the eggs, and also furnishes a means of identification. Enter full particulars of dates in a small book for future reference. It is a poor policy to place a few eggs each day in the drawer—start with a full hatch, or if preferred have a machine with two drawers with adjustable bottoms. For usual work on a moderate scale I prefer a 150-egg machine; such a one costs little more than a small one, and burns only a trifle more oil. As the period of incubation advances the eggs require less top heat, so that if there are eggs at different stages of incubation some will be too hot and some too cool. Where two or more drawers are used, one should have an adjustable bottom which can be raised or lowered. Fresh eggs require to be at least an inch nearer the tank than those which have been incubating for, say, a fortnight. Test the eggs as advised in natural hatching. Should it be desired to add further eggs after that period care must be exercised that the cold eggs do not come in contact with the warm ones already hatching, otherwise chills may destroy the germs. Every few days the water in the pans under the drawer may be changed, and the pans replenished with warm water. Use porous material for lining the egg drawers; this permits of a free passage of the moisture-laden air from below. Ventilation and fresh air are of the utmost importance, and only inferior results can be expected from incubators where these are lacking. The ventilators are closed for the first four or five days, and then gradually opened. Turn the eggs twice a day, and let them cool down in fresh air for a period varying with the temperature of the atmosphere. During the early stages of incubation in cold weather a few minutes will suffice; in the later stages and in hot weather from a quarter to half an hour and even more. Never allow the eggs to become quite cold or chilled. Examine the eggs, as in testing, from time to time, and carefully note the appearance of the embryos at different stages. The day before due date the final inspection should be made and the water pans refilled, close the drawer and leave the eggs to hatch without disturbing them. During the hatch there will be a lot of wet chicks, ducklings, &c., in the drawer, and the cold air admitted, if the drawer be opened, will cause a great fall in temperature, which may result disastrously. Leave the chicks in the egg drawer till fairly dry, and then remove and place in a warm box lined with any old, soft material, woollen for preference. Stand the box above the lamp house chimney, where it will receive any heat required. When all are hatched out remove shells, &c., and clean the drawer, line with a piece of clean, porous material, and you are ready for a fresh start. Many failures are due to lack of ventilation and neglect to air and turn the eggs. Too much heat is also bad, and while no harm may result from a temporary rise of several degrees frequent repetition or long duration will be disastrous. The best place for an incubator is a cellar, or a well-ventilated room free from draughts and not exposed to too much sun heat. Slamming doors, noisy traffic, and sudden jars result in crippled chicks, &c. Smoking lamps and stuffy rooms mean losses and failure. Chicks which cannot release themselves from the shell may be assisted, but seldom make strong birds. To remove from the shell apply warm water (blood heat) freely, and beware of causing bleeding. Simply enlarge the break in the shell, and moisten the lining and membranes, and tap the shell till it fractures in a circle.

Feeding Young Poultry.

CHICKS

The first food may consist of coarse oatmeal, or coarsely ground wheat, or stale bread crumbs. Do not give hard-boiled egg; its use is responsible for much bowel trouble. An excellent food consists of the yolk of a fresh egg whipped up with milk, which is then used for moistening oatmeal or bread crumbs. This may be given for the first week; then add cracked wheat. Give the chicks plenty of liberty, and dig or hoe a small piece of ground for them to scratch in. They find lots of grit and unconsidered trifles, and the exercise makes them grow and strengthens them. Procure some coarse river sand, or fine sharp gravel, and mix with the soft food, or place where they can pick it up freely; this is most important. Feed for the first fortnight every two hours, then gradually lessen to four or five times a day, giving plenty, but allowing none to remain to become sour. Give milk, especially sweet separator milk, if available: if not, a full supply of clean, fresh, well-shaded water, so arranged that they cannot get into it. The first few weeks are important, and ultimate success depends on that period; so keep them well fed and growing. Small, covered yards may be used for the first few days, and a box lined with warm material for the incubator chicks to sleep in during intervals. Unless the weather is wet they will be at work all day scratching and feeding. I have no faith in artificial or foster mothers. They are, as a rule, death traps; and in this climate no artificial heat is required. For years I have used with success ordinary cocoa or similar boxes lined with old, soft material, kept dry and clean. Put about 15 chicks in each box. After a fortnight or three weeks they sleep in a box lined with soft straw, frequently removed, and covered with wire netting. Feed early in the morning and last thing at night. At eight weeks add bone meal to their food; that sold by the Adelaide Chemical Works is exceptionally good. Add daily a tablespoonful for each 12 or so chicks, increasing to four tablespoonfuls at 12 weeks. Green food, chopped finely, should be given frequently throughout the day, and may consist of lettuce, cabbage, &c., or silver beet. Stinging nettle boiled and added with the liquor to the soft food is excellent. After they are a fortnight old bran and pollard, wheat meal, ground oats, and ground barley, mixed with separator milk or hot water, adding daily some boiled meat and soup, may be the chief food, and cracked wheat occasionally during the day and last thing at night. Never give sloppy food of any sort. Mix so that it crumbles readily and does not stick. Give whole grain as soon as they will eat it, say about third week.

DUCKLINGS.

Ducklings do well on food similar to that recommended for chickens, but it should be mixed in a moister condition. Boiled nettle is especially serviceable. Give as much green food as they will eat. Soup and animal food may also be given more freely, and as much milk as they can drink. Boiled rice, especially if boiled in milk, makes them grow, and is excellent during hot weather. Potatoes, if cheap, may be boiled and mashed with the meals with advantage. Add the bone meal after the fourth week, and get the birds fit for sale at eight weeks. Do not use receptacles that allow them to get into the food and water. Small fences made of vertical strips of wood or wire will permit them to thrust their heads through and obtain food and water, and yet restrain them from making a mess. Ducklings are better in small pens, well floored with dry straw.

GOSLINGS.

These require a good range and plenty of grass, as well as added green food. They live almost on this, but should be given as much soft food and grain (in water) as they will eat, as such a course is repaid by extra growth and early fitness for market as prime samples.

TURKEYS

require more care and are often difficult to teach to feed. Some patience is required. They need feeding at least every two hours, as they have crops of very small capacity. Onion tops cut small, green grass, and boiled nettle are very desirable, otherwise feed as for chickens. Do not coddle them, but guard against wet weather. At six weeks old they are generally out of danger, and require a good range and plenty of room in the sleeping quarters—overcrowding spells disaster and diseases. Give bonemeal at about seven or eight weeks same as for chickens.

General.

Keep a wary eye for rats, cats, and similar vermin. Have a well-trained terrier which will not kill the birds, but is a foe to vermin. Look out for lice, tick, and such vermin and make frequent examinations. Chicks if improperly fed suffer from looseness of bowels and the vent becomes clogged. The lump of fœcal matter must be removed with care by applying hot water and cutting the fluff with sharp scissors. Lumps of pollard, &c., on the toes must be soaked off in warm water. Good food, water, green food, grit, cleanliness, and regular attention will ensure success.

Chickens and turkeys require no roosts till well grown. Keep various sizes in separate coops or groups—big and little will not thrive together—the stronger damage the weaker. When at large small chickens, &c., may have their first place inside a ring of wire netting of such a mesh as will permit their passing through, but which will block out the larger birds. With chickens the sexes should be separated as maturity is approached; with the lighter breeds as soon as the cockerels get their tails and begin to crow they should be drafted off to a separate yard as far removed from hens and pullets as possible. Both sexes thrive better apart, and there is no quarreling.

Fattening for Market.

Chickens.—At twelve weeks old the chicks should be well grown, and table breeds and crosses should be at least three pounds dead weight. Select the most forward and coop in separate coops, or if not convenient, in lots of five or six. Feed four or five times a day on barley meal and milk, adding a little sweet fat. This is the best food, but if not obtainable, use bran and pollard or wheat meal and milk. Water will do, but is not satisfactory as milk, and the fat must not be omitted. If for killing, fast for 24 hours so as to have as little as possible in the intestines. For market do not send the birds away immediately after a heavy feed, but give two hours previously a moderate feed of soft food and grain mixed. Birds such as these should weigh up to five pounds. For export the process may begin at ten weeks according to class of bird and state of growth and its condition. Grade carefully, and never forward a mixed lot; send all the best in one crate and the next in another, and so on. Breed good sorts only, and market them in prime condition. It pays well in the long run. Use decent packages and do not overcrowd. Advise consignee in ample time and make it understood what the quality, &c., is.

Ducklings fed as described should be fit at about eight weeks, and it is always a good plan to select the most forward and pen together a week or ten days before disposal.

Markets.

There is a fair local demand for birds of prime quality, and a regular supply from a breeder would lead to good competition and satisfactory prices. Owing to the vagaries of the market and occasional methods of the trade breeders must not be discouraged if they occasionally strike a poor market. Until the trade is on a better basis there will be no radical improvement. A regular supply of poultry of prime quality well graded and fattened would induce many to enter into the export trade, and when that becomes established good times for the breeder will be at hand. Canada is building up a huge and profitable trade in poultry, and the breeders there have a severe climate, and land their goods in England at the season of fiercest competition with English and Continental produce, and are yet gaining ground. This is due to quality and methods of packing and grading. Our goods arrive to bare markets and should realize heavy prices. There is great scope for breeding poultry in this State, and this fact should not be overlooked. There is perhaps no other industry capable of such expansion that offers so quick a return and has such a limitless market for disposal. Poultry breeding is an occupation suitable alike for the strong and weak, and many who are existing on a hard earned pittance might live in comfort if they would bestir themselves. Hard work does not form a great part of the industry—care and attention in small matters are of importance.

It is satisfactory to notice that we have a representative collection of the most suitable breeds now in the State. It is a matter of regret that farmers and others pay insufficient attention to improving the quality of their poultry. There is too much breeding for show and too many country shows. Our fanciers also do a lot of harm, for a great number of utterly worthless birds, as far as utility goes, are bred and sent out. I have as a rule extreme difficulty in procuring decent specimens at a fair price for country friends. The over forcing food given and breeding in small, dirty yards are responsible for much lack of success. It pays only to keep the best class of birds, and these must be bred from sound, healthy stock. You have only to win a prize with some worthless specimens, as far as utility goes, and you are crowded with orders, and yet genuine stock that will pay in every way is overlooked.

LIVE STOCK NOTES.

Sheepshearing is now being carried on, more particularly in the southern districts. Owners should take the opportunity of having their sheep carefully dipped. Lice are on the increase in several parts of the country. The following are the regulations in force under the Stock Diseases Act, 1888:—"Sheep Infected with Lice and Tick to be Dressed.—Every owner having any sheep in a flock or enclosure infected with tick or lice shall dip all sheep in such flock or enclosure as soon as possible after such sheep have been shorn in each year, provided that in no case shall the time exceed one month from the date of shearing. What Deemed Infected Sheep.—All sheep in any flock or enclosure in which one or more sheep shall be found to be infected with tick or lice shall be deemed to be infected sheep for the purposes of these regulations. Owner Not to Allow Infected Sheep on Roads or Reserves.—No owner shall leave, or allow, or permit any sheep infected with tick or lice to stray on public roads, lands, commons, or reserves, nor shall leave any infected sheep travelling from place to place on any roads, commons, or reserves." Attention is called to the fact that owners failing to dip their sheep are liable to a penalty of £5 and upwards.

The reports for the quarter ending September 30 from the inspectors in the different districts still show a number of losses of stock from infectious diseases and also from local ailments. The state of the flocks in regard to tick and lice in the southern and south-eastern districts is not so satisfactory as could be wished for. The results from the use of non-poisonous "dips" and from the carelessness in dipping shows the necessity for greater care and stronger "dips." Flocks dipped in well-known poisonous "dips" are practically free from tick and lice. Especially in respect to the latter parasite it appears useless to use carbolic "dips." Where a dip has been constructed by a company or body for general dipping, it not infrequently happens that portion of the dipping material is used several times, with the result that the treatment fails to cleanse the sheep, and, owing to being dirty, the dip often stains the wool. The travelling of sheep infested with parasites has in several instances been the cause of other sheep becoming infested. Owners appear to forget that they are liable to heavy penalties for travelling sheep infested with parasites. Between 3,000 and 4,000 sheep and lambs have died from worms. Reports were received of 162 sheep being affected with different ailments; 102 sheep died from stomach staggers, sheath disease, gastritis, and one case of multiple abscess occurred.

The lambing in these districts has been fairly good, averaging from 75 per cent. to 80 per cent. of lambs. Beyond the central north it has been very low.

Cattle.—Tuberculosis is being gradually reduced. Ninety-three cases were reported; 73 were destroyed and 20 isolated for further inspection. Of those destroyed 32 were dairy cattle. Five swine were also destroyed, affected with tuberculosis. Fifteen cattle were destroyed affected with cancer, and 15 found affected with actinomycosis, 10 of which were killed. In local ailments, such as impaction and paralysis, pleurisy, hydatids, rickets, acute indigestion, caused from the want of proper food and poorness of pastures, although only 151 cases were reported, out of which 83 died, there were numerous other deaths which were not reported to the staff. Advice as to treatment and feeding has been freely given, and in most cases, when carefully followed, has been successful in preventing further losses. The dry season has, no doubt, accentuated the causes, and increased the number of deaths. For horses the season has undoubtedly been a bad one; 51 were reported as sick and 25 died, the causes being worms, sand, colic, cancer, cerebro-spinal meningitis, strangles, influenza, debility, &c. The cattle slaughtered have been very free from disease, the percentage being nominal; but the condition of many is very inferior. The long distance over roads without both food and water which cattle for slaughter have had to travel has made it most difficult to place the majority of them on the market in condition fit for consumption. The staff have inspected 450,000 sheep, 31,000 cattle, 6,000 horses, 6,000 swine, and a number of camels. Great difficulty is experienced in getting camels properly dressed for mange. The inspectors have travelled over 17,000 miles on duty.

SUGAR BEET AS FOOD FOR SHEEP.

In 1900 experiments were carried out at the South-Eastern Agricultural College, Wye, to compare the food values of sugar beets and mangolds respectively for sheep. Two lots of 12 sheep each, picked out as evenly as possible, were fed on uniform rations of dry food (maize, oats, and linseed cake): the sheep in each lot were given, in addition, mangolds or sugar beet ad lib. The results showed that in a period of 12 weeks the sheep fed upon mangolds gained in live weight, on an average, 40½ lb. per sheep, as against 33 lb. for those fed upon sugar beet, the proportion of dead to live weight and the amount of wool in each case being practically equal. It was found that ten-elevenths of an acre of sugar beet would serve sheep as long as one acre of mangolds, each area providing succulent food for 38 sheep for 12 weeks. The sheep fed upon the mangolds, however, increased 7.6 lb. per head on the average more than those fed upon the beet; or, in other words, one acre of mangolds furnished 293 lb. more live weight than ten-elevenths of an acre of sugar beet. The cost of growing the mangolds was £8 15/9 per acre, while to grow ten-elevenths of an acre of sugar beet cost £9 9/4.

These experiments on the relative value of mangolds and sugar beet as food for sheep pens were repeated last year. The trial began on April, 1901, on two pens of 16 sheep each, all of which were Romney Marsh ewe or wether tegs, about 13 months old, picked to get the two pens as nearly equal as possible at starting. One pen received mangolds, the other sugar beets, the amount consumed being weighed. Each sheep, in addition, received 1 lb. per diem of a mixture consisting of oats, maize, and linseed cake. Water was given, and the folds on the grass were renewed from time to time. The trial began on April 2, and finished on May 28, a period of eight weeks, during which the daily consumption of mangolds per head amounted to 19 lb., as compared with 13 lb. of beef. The average increase in live weight in the sheep fed upon mangolds was 30 lb., or 24.3 per cent., as compared with an average increase of 22 lb., or 18.0 per cent., in those fed upon sugar beet. Moreover, the sheep which had received mangolds handled better, and their wool looked brighter than in the case of those receiving sugar beet. These results were therefore even more unfavourable to sugar beet than those obtained in the trials of the preceding year.—English Board of Agriculture Journal.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of October, 1902:—

Adelaide	1·77	Manoora	2 92	Macclesfield	2·44
Hawker	0 98	Hoyleton	1·75	Meadows	2·08
Cradock	0·77	Balaklava	2·12	Strathalbyn	1·04
Wilson	1·14	Port Wakefield	1·65	Callington	1·51
Gordon	0·70	Saddleworth	2·18	Langhorne's Bridge	1·03
Quorn	1·88	Marrabel	2·33	Milang	0·97
Port Augusta	0·56	Riverton	3·29	Wallaroo	1·25
Port Germein	1·19	Tarlee	2·67	Kadina	1·65
Port Pirie	1·27	Stockport	1·76	Moonta	2·05
Crystal Brook	1·67	Hamley Bridge	1·06	Green's Plains	1·37
Port Broughton	1·80	Kapunda	1·83	Maitland	1·87
Bute	1·49	Freeling	1·38	Ardrossan	1·29
Hammond	0·77	Stockwell	1·90	Port Victoria	1·62
Bruce	0·88	Nuriootpa	2·16	Curramulka	2·37
Wilmington	2·50	Angaston	2·37	Minlaton	1·39
Melrose	3.51	Tanunda	2·27	Stansbury	1·75
Booleroo Centre	2·45	Lyndoch	1·87	Warooka	2 23
Wirrabara	2·63	Mallala	1·46	Yorketown	1·77
Appila	1·55	Roseworthy	1·24	Edithburgh	1·42
Laura	2·84	Gawler	1·51	Fowler's Bay	1·68
Caltowie	2·17	Smithfield	1·18	Streaky Bay	1·73
Jamestown	1·75	Two Wells	1·05	Port Elliston	1·71
Gladstone	2·40	Virginia	0·90	Port Lincoln	2·05
Georgetown	2·72	Salisbury	1·11	Cowell	1·05
Narridy	2·05	Tea Tree Gully	2·03	Queenscliffe	1·60
Redhill	1·73	Magill	1·93	Port Elliot	1·14
Koolunga	1·53	Mitcham	1·52	Goolwa	1·54
Carrieton	0·93	Crafers	3·36	Meningie	1·47
Eurelia	0·93	Clarendon	1.87	Kingston	2·02
Johnsburg	0·67	Morphett Vale	1·21	Robe	1·49
Orroroo	1·11	Noarlunga	0·99	Beachport	1·44
Black Rock	0·90	Willunga	1·81	Coonalpyn	1·17
Petersburg	0·94	Aldinga	1·19	Bordertown	2·18
Yongala	1·10	Normanville	0·62	Wolseley	1·61
Terowie	1·18	Yankalilla	0·84	Frances	1·65
Yarcowie	1·19	Eudunda	1·69	Naracoorte	1·97
Hallett	1·63	Truro	1·96	Lucindale	1·32
Mt. Bryan	1·83	Mount Pleasant	1·89	Penola	3·09
Burra	1·85	Blumberg	2·24	Millicent	2·32
Snowtown	1·28	Gumeracha	2·29	Mount Gambier	2·63
Brinkworth	1·67	Lobethal	2·29	Wellington	1·63
Blyth	1·33	Woodside	2·14	Murray Bridge	1·27
Clare	3·27	Hahndorf	3·24	Mannum	0·95
Mintaro Central	3·52	Nairne	2·59	Morgan	0·92
Watervale	3·94	Mount Barker	2·41	Overland Corner	1·05
Auburn	3·18	Echunga	2·35	Renmark	1·97

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report on November 1:—

The weather was very favourable during October, so that reasonable assurances now prevail of at least fair crops being obtained over most of the older districts, but as mentioned in our last, nothing then could give a harvest this year to the drier parts of the State. Even some of the best of the Northern Areas, where good yields are generally reaped, will, it is feared, average but little more than seed this season, so that speaking generally, the year is a poor one for agriculturists, although in favoured parts they will probably do well, as the price of produce is likely to rule high.

The commercial outlook in South Australia is certainly better at the moment than in some of the sister States, where the effects of the drought have been much wider spread than here. City trade is fair, and there is satisfactory business doing in the country where any produce is available, the higher prices making up to some extent for the lighter yield. Mining matters are quiet.

The prospects of there being any surplus wheat for shipment to Europe after harvest has not improved during the month, but as local prices for the next twelve months will be influenced by outside rates, it is interesting to review the situation and reckon out probabilities. London reports a steady market, although freights have been falling. Cargoes of wheat from the Pacific Slope to United Kingdom for orders are being taken as low as 22/6 per ton. In proof of the belief that Australia this year will not raise enough for her own wants, we learn that Sydney and Queensland have arranged several cargoes from 'Frisco, but so far Melbourne millers have not yet ordered from America. Melbourne merchants and millers have been buying freely in Victorian country districts at equal to 5/3½ Melbourne, and as stocks at railway stations are now reduced to 90,000 bags, holders ask an advance on the price mentioned. In South Australia as usual the first wheat of the season has been reaped and delivered at Port Germein during the last days of October, but harvesting is not general yet, and as crops in the earlier districts this year are mostly poor, wheat harvesting will not be general for some weeks yet. During the month a fair quantity of old wheat changed hands at 4/8 to 4/9; some vendors reporting sales up to 4/10. We hear of a sale of 4,000 bags at 4/7 at an inland station, which means 4/10½ f.o.b. Port Pirie, and as holders are now few, it is difficult to say what price would procure a decent sized parcel. The little new that has come in sold from 3/9 for poor to 4/4 good samples, whilst November deliveries are being made on the basis of 4/6 f.o.b. outports. There has been rather better demand for flour, one holder having quitted 1,000 tons at from £9 2/6 to £10 f.o.b. Port Adelaide, a price rather under what would now be accepted for best brands. The fodder market here is not quite so brisk, chiefly in consequence of good rains over a considerable portion of New South Wales causing lessened demand for hay and chaff for export. Haymaking is in full swing in some districts, and farmers desirous of selling are able to obtain a good market though export values have fallen. The production of bran and pollard being small owing to the large number of mills that are shut down, these lines have more than sustained in price. Western Australia is drawing the bulk of its supplies from New Zealand, but Sydney and Queensland demand keeps values firm here, and no serious fall may be looked for until milling operations be extensively resumed. Buyers of feeding grains await the new crop, meanwhile quotations are only nominal.

Holders of Gambier potatoes were forced to give way a little to clear stocks, and the season for these may be considered over. New locals are coming in very sparsely, the earlier crop having been much cut down by frosts during the dry winter; the prospects, however, of the following crop on the plains is said to be good. New onions have taken control of the market, and are plentiful, but not yet fit for export. Holders of the old season's crop who did not sell when high rates ruled have since fallen in badly, and were in some instances forced to pick over several times before finding buyers at steadily falling rates.

As usual during October heavy business was done in dairy products. The flush season for butter has come and gone already, supplies now shrinking steadily, though we are still about able to fill local wants. Eggs continued to rule at high rates for time of year, and many local bakers delayed putting down for future wants in hope of price easing; the trend, however, has been upward, and as Sydney and Melbourne buyers are now keen on this market, prospects favour still higher rates. Heavy interstate demand for bacon forced values up here, and the market for hams is also strong, with supplies very short. New cheese is reaching the city and finds ready buyers at good price. Honey had a rise in value, but continues to sell freely. Beeswax dull at moment. Almonds very saleable at good rates.

Some carcase meat has continued to reach market, mostly in good condition owing to the cool weather that prevailed, but at late sales an increasing proportion has shown off condition when catalogued, and although price is still good, the season is getting too far advanced to forward fresh meat from any distance with safety. The supply of live poultry has been short of trade wants, although high prices have ruled. Brisk demand in all feathered lines.

MARKET QUOTATIONS OF THE DAY.

Wheat.—Old at Port Adelaide, shipping parcels, 4/10 to 5/, f.o.b.; farmers' lots, 4/7 to 4/9 on trucks, per bushel 60 lb.

Flour.—City brands, £10 5/ to £10 10/; country, £9 15/ to £10 per ton 2,000 lb.

Bran and Pollard.—1/7 per bushel 20 lb.

Oats.—Local Algerian and Dun, 3/6 to 3/9; prime stout feeding whites 4/ per bushel 40 lb.

Barley.—Malting, 4/9 to 5/; Cape, nominal 4/ to 4/6 per bushel 50 lb.

Chaff.—£5 to £5 5/ per ton of 2,240 lb., bags in, dumped, f.o.b., Port Adelaide.

Potatoes.—New locals, £9 10/ to £10 per 2,240 lb.

Onions.—Local Spanish, £4 10/ to £5 per 2,240 ℔.

Butter.—Creamery and factory prints, 10½d. to 11d.; private separator and best dairy, 9¾d. to 10½d.; well graded store, 9¼d. to 9½d. per ℔.

Cheese.—S.A. factory, new, 8d. to 8½d.: imported, 9d. to 9½d. per ℔.

Bacon—Factory cured sides, 11d. to 11¼d.; farm lots, 9d. to 9½d. per ℔.

Hams.—S.A. factory, 1/ to 1/1 per ℔.

Eggs.—Loose, 8¾d.; in casks, f.o.b., 10¾d. per doz.

Lard.—In bladders, 9d.; tins, 8½d. per ℔.

Honey.—3d. for best extracted, in 60 ℔. tins; beeswax 1/1 ℔.

Almonds.—Fine softshells, 6d.; kernels 1/ per ℔.

Live Poultry.—Heavy weight table roosters, 2/ to 2/6 each; cockerels and hens in good condition, 1/4 to 1/9; light birds, from 1/2 to 1/3; ducks, 1/6 to 2/5: geese, 3/3 to 3/9 for poor to ordinary sorts; pigeons, 4½d.; turkeys, 8d. to 10½d. per ℔. live weight for fair to good table birds.

Above quotations, unless when otherwise specified, are duty paid values on imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

DATES OF MEETINGS OF BRANCH AGRICULTURAL BUREAUX.

With a view of publishing in the "Journal" the dates of meetings of the Agricultural Bureaux, Hon. Secretaries are requested to forward dates of their next meeting in time for publication.

Branch.	Date of Meeting.	Branch.	Date of Meeting.
Arthurton ...	Nov. 13	Nantawarra ...	Nov. 12, Dec. 10
Balaklava ...	8, Dec. 13	Norton's Summit ...	14, 12
Booleroo Centre ..	10	Onetree Hill ...	14, 12
Brinkworth ...	14	Paskeville ...	15
Burra ..	14	Port Elliot ...	15, Dec. 20
Cherry Gardens ...	11, Dec. 9	Port Germein ...	8
Clare ...	14, 12	Port Lincoln ...	21
Crystal Brook ...	15	Port Pirie ...	15
Dawson ...	15	Pyap ...	12, Dec. 17
Finniss ...	3, Dec. 1	Quorn ...	15
Forest Range ...	13, 11	Rhine Villa ...	15
Hahndorf ...	15	Richman's Creek ...	17
Hartley ...	— Dec. 12	Riverton ...	15, Dec. 13
Johnsburg ...	15, 13	Saddleworth ...	21
Kingston ...	1, 6	Scales Bay ...	15
Koolunga ...	13, 11	Stansbury ...	1, Dec. 6
Lyndoch ...	13	Strathalbyn ...	— Dec. 15
Maitland ...	1, Dec. 6	Swan Reach ...	15
Mannum ...	14	Wandearah ...	10
Meadows ...	17	Willunga ...	1, Dec. 6
Morgan ...	8, Dec. 13	Wilmington ...	12, 10
Morphett Vale ...	4	Whyte Yarcowie ...	15
Mount Remarkable ...	13	Yankalilla ...	— Dec. 5
Mundoora ...	14		

AGRICULTURAL BUREAU CONGRESS.

(Continued from October issue.)

Thursday Evening, September 11.

Mr. H. Kingcome (Port Germein) read the following paper on

DAIRY COWS.

Amongst farm live stock there is no animal more difficult to judge, more complex and deceptive than a dairy cow. The value of most farm animals can be determined by the physical characteristics, by their shape and general appearance, and whilst outward form cannot be disregarded in estimating the value of a dairy cow, looks often count for very little in filling the milk pail, or in producing a large quantity of butter. Some very good looking cows are often possessed of poor udders, and not infrequently the cow having the largest show for milk yields a much smaller quantity than her appearance would lead one to expect. There are other points in which the dairy cow is deceptive, and which cannot be determined by the human senses, either by the eye or hand.

No dairyman can tell, for instance, how much butter a certain quantity of milk will produce until he has tested it in the machine or by churning. It does not follow that a large flow of milk will be poor milk; there is doubtless a tendency in that direction; but, on the other hand, there are many cows which not only yield a small quantity of milk, but milk of an inferior quality from a butter making standpoint The aim of the dairyman is to make a profit by his business, and whilst some may strive to obtain that result by maintaining a breed of cattle like the Holstein, for instance, which are noted for their large milking properties, others prefer the Jersey, which gives a much smaller quantity of milk, but of a richer quality—both may be right, and they may also both be wrong. In the former case, however, the chances of making a profit, the largest possible, are greater than in the latter, for the reason that the cows giving poor milk generally more than make up for it by the extra yield. Quantity is the first essential in milk. The most profitable milk is that in which these qualities are combined in the same animal, and where we invariably find an ideal dairy cow. The prevailing idea in many quarters is that if the quality of the milk be increased, dairying will be more profitable to the producer, and on pay day at the butter factories it is common to hear the supplier, whose milk averages 3d. per gall., complaining, and making a noise about the low price of milk, and arguing that it does not pay to produce at that price. Another supplier's milk probably averages 4d. per gall., and he is quite elated, but an analysis of their respective returns would perhaps show that the man who delivered the poor milk was obtaining a better return per head from has herd than his neighbour who received 1d. per gallon more for his rich milk. To make this point clear, take for instance, the case of two farmers A and B. A owns 10 cows which give 4 galls. milk every day each, or 1,200 galls. for the month, 3.4 per cent. milk, equalling 449 ℔. butter, this at 10d. ℔. is £18 14/2 for the month. B has also 10 cows who give, under the same conditions, 2 galls. of milk per day, and only 600 galls. per month of 5 per cent. milk, which is equal to 339 ℔. of butter at 10d.—£14 2/6 for the month; it is easy to perceive which of the two herds is to be preferred. I have quoted extreme cases, but they will more clearly demonstrate the fact that quantity is necessary as well as quality, and that rich milk is not always the most profitable milk. We cannot increase the percentage of butter fat in a cow's milk by extra feeding, but we can greatly increase the quantity of her milk by such means. The milk yield is regulated to a large extent by the amount of food supplied, but the property of giving rich milk is an inherited function, and can only be developed or attained in the animal by breeding from pure bred stock possessing that quality. We want rich milk, but we also want plenty of it. There are no outward or visible signs about the animal to tell us whether she will give rich or poor milk, but the dairymen have now a simple means of testing the milk of individual animals, and weeding out the unprofitable members of their herd. Every farmer should make it a rule to test his cows regularly, and know exactly what each animal is doing; it is not sufficient to depend entirely on the returns from the butter factory, as when the milk is pooled it is impossible to select the most profitable cows in the herd with anything like accuracy of judgment. However, the marks of a good cow showing whether she is capable of producing a large quantity of milk are tolerably plain to all who are acquainted with cattle, yet there are such a variety of relative points requiring consideration that we can only picture them in the model. The best milk cow, as a rule, is of medium size and small boned. The head is small and rather long, narrow between the horns, and wide between the eyes. The ears are thin, covered with soft silky hair, the inside of the ears being of a rich orange colour. The eyes are large and bright, with a placid expression, the horns set on a high pate, bending wide apart at the base and curving inwards and upwards at the points;; the neck long and thin, slender, and well cut under the throat, thickening handsomely as it approaches the shoulder, but entirely free from anything like a beefy appearance. The shoulder blades should meet narrow at the top, widening gradually towards the points, which should be broad and well rounded; the ribs rather straight and wide, indicating a good digestion and constitution, for everything depends on that in a good milk cow. The loins should be broad and the hips high and wide; the rump even with the hips, the pelvis wide, giving plenty of room for the udder; the thighs thin, the hind legs a little crooked, with a long large foot and of a yellow butter colour. The milk veins in front of the udder are usually an infallible mark of a good milk cow, and the larger they are the better the indications. In extra good cows they branch out into four arteries along the belly, but they all unite before reaching the udder. The more irregular the course the more certain you may be the cow is a good milker, but the veins give no indication of the quality or richness of the milk. The udder should be covered with a short, downy coat of hair; this hair should begin to turn its backward course from the front teats running in this direction between the teats, then on the back part of the udder called the escutcheon, and on as far as the vulva in the best cows. The wider the belt of this upturned hair the better. It should be short and velvety, covering a soft orange coloured skin. The shape and size of the udder is, however, by far the most reliable index of a good cow, all the other marks are only of relative importance, and it is better to have a scraggy looking cow any day with a good udder than a grand looking beast with a miserable bag. No matter how good looking a dairy cow may be, except she has a well developed udder with its accompanying network of mammary glands, she cannot be expected to excel as a pailfiller. As a rule, heavy milkers are seldom the best-looking cows; it is the almost invariable rule to find cows which are good at the pail very thin in the flesh, narrow across the shoulders, slack over the loins, and in other ways deficient from a butcher's point of view. The ideal udder is the one which is well developed both fore and aft, one that is carried high up towards the escutcheon, and at the same time goes a long way forward under the belly. In addition to this the udder must be deep, and the squarer the better, its four teats should be of good size, and placed as nearly as possible at equal distances apart. Cows possessing udders of this kind may always be counted on to prove good milkers, just as other cows possessing small teats, so close together that they almost touch one another at the points, may invariably be put down as poor pailfillers no matter how fine their appearance may be, or how good looking in other respects.

Another good sign; in fact, one of the best, is a good appetite and a smart eater. The old proverb says:—"Slow at the meat, slow at the work." Let any practical dairyman, who has handled numerous cows, say whether he has not always found his most profitable animals quick and greedy eaters. There is a great difference remember between a quick eater and an insatiable eater; the former is a profitable, and the latter an unprofitable, animal. Some cows are perfect gluttons, and will readily consume more food than would be sufficient for two or three ordinary cows; but languid eating without apparent zest or enjoyment is a token of feeble digestion, inability to take into the system promptly and fully the nutritive parts of the food. The animal that eats with perfect relish is not always the animal that eats longest or that eats most, but its eagerness shows a good and healthy appetite, the result of strength and soundness of the digestible organs. Of course, this sign must be taken in connection with other characteristics, and it will be found one of the most important points to observe in the study of a good dairy cow.

Mr. Kingcome said he wished to explain that he had gained much information regarding dairy cows from Mr. Thomson, the Government Dairy Expert, when the latter visited the Port Germein district a few years ago.

Mr. Molineux—I do not believe there is a man in Australasia who is more competent to give advice on the management and science of dairying than Mr. Thomson. I am sure he will be willing to go to various centres to deliver lectures during the period of his extended engagement after his return from Europe. I wish to throw out the suggestion to the branch Bureaux that several of them should combine so that a meeting to be addressed by Mr. Thomson could be held at an appointed place. This would be far better than holding a meeting in one district in which there was only a few people.

Dr. Ockley (Penola)—Mr. Kingcome, when he stated the difference in the yield of milk, did not also take into consideration the question of the amount of feed given to these cows which returned the larger quantity of milk. Very likely the cows giving the smaller quantity of milk would consume less fodder than the larger cows. Therefore, I can safely say that if 12 smaller cows eat no more than 10 larger ones, and the milk from the former is richer than that from the latter, then you would get a greater profit from the smaller animals. Even if the milk were sent to the factory you would get a better return for that from the smaller cows than that from the larger animals. I agree that feed has a great deal more to do with the quantity of milk than the quality. You must have breed if you want quality, and, as regards this, I know of no cow to compete with the Jersey. If you want butter you should get the Jersey.

Mr. Brown (Port Elliot)—The writer of the paper stated that the feed given to cows would not increase the butter percentage of the milk, and I am quite prepared to contradict that statement. I am an old market gardener, and have fed cows on carrots and cabbages, and when I gave them a certain quantity of parsnips every day more butter was obtained from the milk, although the quantity of the milk was not increased.

Mr. Kingcome—You cannot increase the quality, but you may the quantity.

Mr. Dall (Nantawarra)—I think the feed given to a cow has a great deal to do with the quality. A neighbour of mine removed a cow to a place near Gawler, where the feed was not so good as that the animal had been used to. The owner sent the cream to Adelaide, but the butter it yielded was not nearly so much as had been the case previously. At first he thought that he was being cheated, but afterwards found out that there was not so much butter-fat in the cream on account of the want of good feed.

Mr. McEwin—I think Mr. Kingcome has given a good description of a dairy cow, but it was a pity he did not give some advice as to how to breed a good dairy cow. You can easily judge such a cow without taking into consideration many of the points that have been mentioned. Get a cow as squarely on her "pins" as possible. She should have plenty of breadth and width behind, and should be small and narrow in the front. The feed should go into the stomach to make milk and not meat. My advice to those going into the dairying business is to get a good breed of cows, and crossing a Jersey bull with good Shorthorn cows will give satisfactory results.

Mr. Birks—What would you cross the progeny with?

Mr. McEwin—I do not believe in getting away from the first cross. I believe you can get a good cow from the second cross, but after that you would be getting them too fine.

Mr. Campbell (Millicent)—I think the milk and beef cattle totally different breeds. It was a great mistake to fatten old dairy cows for the butcher. The best step to take was to knock them on the head and get the skin.

Mr. McKay (Penola)—I would fatten dairy cows for the butcher when I had done with them so long as I could make money by doing so. I like the cross with the Ayrshire. The Ayrshire is exceptionally hardy, and also a very fair breeder.

Mr. G. A. Payne thought it was a great pity that the residents on the Murray Flats did not enter more heartily into the water conservation scheme offered them some years ago. With a supply of water the district was capable of producing heavy crops of green fodder and vegetables.

Mr. Aldenhoven (Woolundunga)—Different districts want different cattle. We have tried the Jersey in our district, crossed with all sorts of cows with more or less of the Shorthorn in them. Mr. Thomson was delighted with some of the cattle. They are not beefy cattle; yet would sell readily to the butcher, if not required for milking. If you get a good milker, by the time she is too old for the dairy she ought to have paid for herself in butter.

Mr. Gregory (visitor) — Judging by his opening remarks, I hardly knew whether the writer was a bit green or not; but when it came to the latter part I saw he understood something about cows. I agree with him in the main as to most of his remarks about the good dairy cow, but I do not like the long-faced cow. She is a fidgety brute to milk, and is not so good a dairy cow as the good faced cow with a nice kindly eye and face. I do not agree with the writer as to the feeding. You can increase the quantity as well as the quality of milk by feeding. If a cow is fed with a good deal of soft food in winter time she will give a lot of milk; but bring her down on the plains just when the dandelions are out in blossom and you will find that the cow will give more butter, but no more milk. If you feed the cow with feed of good quality, as well as plenty of moisture, she will increase the quantity and quality of milk. I do not like to see an animal picking over its food. It is a good healthy sign if the animal goes for her feed as if she really wanted it. I do not believe in crossing cattle too much, but if you have pure-breds on both sides it is all right. From half-breds on both sides you do not know what you are going to get.

Mr. A. J. Davis (Riverton)—I agree with the paper in the main. We cannot fix on a hard-and-fast rule. For instance, cattle that will do in the south will not suit us in the middle north. A cross with the Holstein is a good serviceable cow. It is good for dairying or beef, and young stock develop into big cattle quickly. The feeding of a cow has a lot to do with it. My idea of a good cow is a wedge-shaped cow. In the north we often keep too much stock on our farms, and they are starved. It does not pay to keep starved stock.

Dr. Ockley (Penola)—The dairyman in England goes in for pure-bred stock, and only the best are kept. Here we want to make as much as we can, and we do not like to kill a calf. It is, however, economy to kill it and have done with it, for the first loss is the least. If you can sell the calf, all the better. When you have your first cross cows spey them when three months in milk, and you can keep them in milk for four or five years. The operation can be performed without losing more than about 2 per cent. of the cows.

The Chairman—My experience has been that you will get good and bad milkers in all breeds.

Mr. Kingcome—In reply to Mr. McEwin, I may say I first got my breed from a Holstein bull and Shorthorn cows. I had to cull a great many of the progeny, but when I got a good animal I kept it and bred from it.

Mr. J. W. Dall (Nantawarra) read the following paper on

APPRENTICES ON THE FARM.

The successful cultivation of the soil and the settlement of the people on the land in such manner as to establish themselves and help to give stability to the State is one of the most important subjects we can deal with. On the solving of these problems so much depends, that they claim our earnest consideration. Looking thoughtfully at the matter, we naturally seek for some way of improving certain wants that appear on the surface, and one of the many that every farmer feels is the great dearth of suitable labour on the farm. Not that there is any difficulty in getting men or boys, but the trouble is to get some that are really useful. This want is making itself felt more each year as we are adopting better methods, and using improved machinery, and is a serious loss not only to the farmer but also to the employe or those who fain would be employed, but being unacquainted with the work, and having no credentials to show, lose the chance of employment. I think the system of having apprentices on the farm would be one of the best remedies for the trouble. This method of training the youth of our land to the work he may desire to follow as his calling is adopted in most trades and professions with success, and why should not we as farmers do the same? I see no reason why many should not seek to learn farming if the way was open to them; yet who ever heard of a farmer in this State taking on an apprentice, or what youth ever heard of a farmer wanting one? We have known of lads willing to work for food and clothing, or for a very small wage, and who have in the end made useful men, and have helped themselves to positions that they could not otherwise have gained but for the fact that they learned to do work that the rank and file could not do.

Here let me ask who knows of a young man good at his work and possessing a good character seeking employment for long in a farming district without finding it? As a rule a young man of this sort knows where he can get a job if he needs it, and often has the choice of two or three places. Why is this? Simply that he knows his work, and can be trusted.

This brings me to the statement that the farmer should be willing to take an apprentice and teach him his business; for a business it is, and a very good one too, look at it from what side you will. The time is coming, I am convinced, when its healthy independence and its wealth will commend it to many who have regarded it as drudgery. I admit there are some difficulties in the way of my proposal. First, the farmer is not as a rule situated near a town from which he would get the class of lad he would require, for it is from the cities we must expect those who would be likely to want to learn farming. Youths in the country generally become useful on the farm long before a lad not brought up to rural life. Besides parents in the country do not usually find the same difficulty in putting their boys in a position to earn their own livings as do the city parents. I quite believe many parents would be glad of the opportunity of having their sons taught practical farming by a good and respectable farmer, and the lads would not object.

In order to give parents a chance to apprentice their sons, and farmers a chance to secure apprentices, I would suggest that each branch of the Bureau, and the Secretary of the Department of Agriculture, should keep a register of the names of those willing to become apprentices, and of those farmers requiring such help. The Journal of Agriculture might be utilised for advertising these registers.

Now we come to the question of terms and conditions, and I may be asked how can parents afford to send their sons to learn farming? Take an ordinary trade apprentice; he only gets a few shillings a week to start with, and has to be fed and clothed; but how is he going to feed and clothe himself on a farm? There should be no difficulty on this point, however; the farmer could fairly board the lad, and his parents keep him in clothes. I am sure that a youth of 15 can, if he will, soon make it worth the farmer's while to provide for him. Everything would not be plain sailing, but the help would be mutual; as farmers we feel the need of skilled labour, and we should be willing to lend a helping hand to any industrious youths in our endeavour to meet that want. Probably I will be expected to suggest terms or conditions upon which an apprentice could be employed, particularly as to wages or premium. I admit this is a difficult point, so much depending upon individual conditions. I think, however, that taking a lad of 15, who boarded himself or lived at home, we might pay him £10 the first year, and give him a rise of £10 each year for four years, making the term of apprenticeship five years. If the farmer provided board and lodging, half the amounts should be charged against the apprentice. This arrangement would help the youth and his parents in the first years of the term, and in the latter if the apprentice turned out as they might reasonably expect, the farmer would be recouped for his trouble in teaching. Under such a system it would pay the farmer to encourage the lad to learn all he could about farm work. At the expiration of his term any intelligent youth would be able to command the ruling rate of wages, besides being competent to set up for himself should opportunity occur. Parents will naturally ask what will you teach the boy on the farm? My answer is, the thousand and one things the agriculturist must learn. This includes lessons in practical agriculture, the selecting and building up of the home. It means really training his hands and eyes to enable him to make the best of circumstances as he finds them. It was at one time thought by most people that any man could be a farmer, and it was only necessary to secure a piece of land and go ahead. This, however, is not the idea of those who have been engaged in the work for years. They feel that they only know very little about plant life and its requirements, the treatment of the soil, &c. They can look back on hard toil and lost capital which might have been avoided had they only had more knowledge of the work they were undertaking. In how many cases have we seen men who have started farming with sufficient capital to have ensured success had they possessed the requisite knowledge, and yet have lost their money while they gained that knowledge by hard practical experience. The old adage that "knowledge is power" is true in farming as in other things.

Mr. Aldenhoven—The subject was ably dealt with. There is a great tendency, not only in this country, but in other countries, to drift to the towns and cities from the rural centres. I was much struck some time ago, and it grieved me, to see the disparagement in some people's opinion of their own calling. We should educate the people up in a pride of their own profession, and if we did this in connection with the farmers, there would be no difficulty in getting apprentices to work on the farm. In some cases the parents are at fault in not providing attractions on the homesteads. The work of the young people is very often made a drudgery, and this is not conducive to an efficient system of apprenticing.

Mr. Campbell (Millicent)—I do not think the idea will work. To educate apprentices a man ought to be capable, and an efficient teacher. He should also understand the scientific side of the farm. If that idea were carried out, the work would certainly become a drudgery to the apprentices. The members of the Bureau are learners themselves, and how could they take apprentices to teach. The whole difficulty lies in the want of opportunity for social intercourse and pleasure. If the farmers would provide means whereby work would be made attractive, I do not think any difficulty would be experienced in getting apprentices to take up positions.

Mr. Henley (Finniss)—I have had lads who generally stayed with me for two or three years, and I have taken them as young as 15 years of age. My idea was to make the wages progressive, and I have found that in a few years these lads have been of more use to me than any men I could get from outside. I instructed them in the use of farm implements, and paid special attention to their training. One of my lads recently went to Western Australia, and I got another man, but he would only work while I was there. In the end, I got one of my lads back again, and he was twice as quick as the other man.

Mr. Illman—I have had some experience in this matter. I was brought up on the farm, but drifted to the city, and subsequently returned to farming pursuits. I do not think anybody need be ashamed of the profession of farming. Farmers ought to be just as proud of their calling as the judge or the lawyer. My boys get half a day off every week for the purpose of recreation, and I think that is one of the chief reasons for keeping them on the farm.

Mr. Brown—I think the subject is one well worth discussion. I had a boy for six years, and he proved to be an efficient apprentice. The trouble is with reference to wages. A farmer cannot afford to give more than five shillings a week for a start. The boy does not think he is getting sufficient, but he is not worth much more to the farmer at that time. I cannot find men upon whom I can depend. My boy took the drill with two quiet horses the other morning, and did very well. He has now gone to Western Australia, and I guarantee he will secure a position as a first-class man. It is a serious matter to get a good farming man in South Australia. They are very, very scarce. Probably the reason is that farming is at a very low ebb this year.

Mr. Gregory—The difficulty is to keep the farmers' sons on the farm. I have lived in my district for the last twenty years, and I have noticed that three-quarters of the young men drift into the city. I have met several of these, and they tell me they are getting good wages, and like their positions better than farming. The difficulty is for the farmer to find employment for his own sons. I think the majority who come to the city like to stay there.

Mr. Scriven (Orroroo)—I think it is a very thoughtful paper. Mr. Dall looks at the question from a national standpoint. Nothing has been said about the good that would accrue to the country through young men being trained on the farm, and being accomplished farm hands. If all farmers had the same kind of men as I have had, they would wish that this system of apprenticeship had come into vogue years ago. My experience has been that most of them cannot be depended upon to do their work as it should be done unless you are there all the time to see to it. We want some system of training the young men to become competent farm workers, and people are waking up rapidly to that fact.

Mr. C. E. Daniel (Inkermann)—I agree that there is a great want of skilled farm labour. It is a job to get a man who can take a stripper and who can drive six horses in a plough. But where can we get boys 15 years of age to work for £10 a year? We would have to offer them more. A decent lad should be able to take his place on the farm with a team long before he has been there five years.

Mr. Molineux—I agree that a man employed on a farm must not look for a fortune. If he has enough to eat and drink and sufficient leisure he is the happiest man on the face of the earth. You will not get young men to go on the farm unless you make farm life attractive to them. Hard toil, hard living, poor clothes, and the worst of implements, are not attractive to a young fellow. A young man would not want to be three or five years on a farm to learn the ordinary business. It is not every farmer that can teach the science of farming. They can teach the practical work. Some farmers would only teach the boys the drudgery.

Mr. McEwin—Hard experiences for boys make good men of them. I disagree with Mr. Campbell in saying that farmers are not fit to teach apprentices. I maintain that it takes much longer to educate a man on the farm than is supposed. The older a farmer lives the more he finds he has to learn. You put more responsibility on the man on the farm than on the trade apprentice in the city. There is no doubt farmers are a good deal to blame for the kind of men they get under them. I do not have much trouble. I think we could give apprentices a little more than Mr. Dall proposed. After all, the keep of a boy on a farm would not be very much. If you keep men on all the year round and they know they will be kept on, they will work like tigers when there is any real necessity for it, as at harvest time. Boys would stick to us if we treated them properly. It is a question of pounds, shillings, and pence. If wheat were 5/ a bushel, and we could make something out of farming, and pay better wages, we would get plenty of men.

Mr. Aldenhoven (Woolundunga)—I think we should urge that agriculture be taught in the schools.

Mr. Kennedy (Kadina)—This is a very good paper. As to employing our families on the farm, I think very often we do not take sufficient care to keep our own boys and girls on the farm. As a rule, farmers do not make home life attractive enough, nor do they give the children sufficient interest in the farm. When my children were going to school I allowed the girls to rear a couple of calves each. By the time the girls left school they had two cows and an income at once. They kept accounts, and very often I found I owed them £10 or more at the end of the year. I gave the boy an interest in a horse or two, and when he was 21 I owed him something like £100 for foals. This system teaches the children the value of money, and gives them a real interest in their work. Then I arrange croquet playing on Saturday afternoon, and the young people always get their work done in time, and have many a happy afternoon. I have had 40 people at my place, and on some of the homestead meetings in connection with the Pine Forest Branch I have seen 100 young people present. We should encourage the young people to take an interest in the farm, and should also provide facilities for healthy amusements, and not keep them the whole week in drudgery.

Mr. Summers—Apart from the question of whether this system of apprentices could be adopted, I would point out, in reply to Mr. Daniel, that if other conditions were sufficiently attractive, £10 to £15 per annum should tempt boys of 14 years of age from the town. Many lads of 16 or 17 years enter the public service at 10/ per week, and their parents have to feed them. Apprentices on the farm getting £10 per annum and their food and an increase of £10 each year as suggested would at 18 or 19 years be better off than many town lads of the same age.

Mr. Dall—This subject suggested itself to me, by seeing so many youths in the city apparently doing nothing. It struck me that this labour might be utilised by the farmer with advantage to himself and the youths, and to those to whom they belonged. I deny that the average farmer is not capable of teaching the youths. I don't say he can teach the sciences, but he can teach the practical part, and the young man can acquire the theory with the aid of books. It has been said a youth ought to learn to farm in less than five years. If he could not I would be sorry to have any thing to do with him. Some town boys at first would hardly know a cow from a bullock, and there is difficulty in starting a lad of that sort. If we put up with that in the begining, we expect some return in the end. We should look at the mutual advantage from services rendered and lessons taught. I feel disappointed with some of the remarks, which have been irrelevant. There is more in the question than we imagine. Some boys have been roughly used, but that is the exception. Many boys in the city would find it an advantage to be in the country and they would help the country very materially.

Friday, September 12.

FREE PARLIAMENT—POSTCARD NOTICES OF MEETINGS.

Mr. Bauer moved—"That the suggested abolition of the notification of meetings by postcards and the adoption of a programme of meetings for the year be not adopted."

Mr. Jorgensen seconded.

Mr. Rendell moved as an amendment—"That the suggestion be adopted."

Mr. Johns seconded the amendment, which was carried.

THE BUREAU YEAR.

Proposition from the Balaklava Branch—"That for all purposes the Bureau year commence on July 1."

Mr. R. Campbell moved that the proposition be agreed to.

Mr. Hewitt seconded. Carried.

INCREASING THE USEFULNESS OF THE BUREAU.

Mr. Lehmann suggested the adoption of a regular system of reports from members. Each member should be expected to report on results of the year's work in various branches of farm operations. This would lead to considerable enquiry from those getting best results as to how such results were secured. For instance, most of them kept sheep, and if on the reports for the year being given it was found that one member was averaging 3 lb. of wool per sheep more than the others it would show that there was room for improvement. Those whose reports showed that they failed to benefit from the information disseminated at the Bureau meetings would be adversely criticised. The same with cattle, poultry, results of the use of manures, &c. The adoption of such a system would result in better and more regular attendance of members, and the publication of these reports would lead to a very general demand for The Journal of Agriculture, as it would make it far more valuable than at present.

Mr. Kennedy (Kadina)—I think it is a good practice for members to visit one another's farms and note how the haystacks are built, the gates hung, and the implements housed. There are a hundred things that members could inspect and praise or criticise in a friendly way. The farmer being visited should take the criticisms kindly. You might see a single plough hanging up for a gate. There would be lots of things to show whether a man took care of his place or not.

Mr. Blackham (Onetree Hill)—I do not think the system of going round and picking holes in your neighbour's management would improve matters. I think the secret of all success lies in the individual members. Notices should be put up at the post offices, stating the subjects to be discussed and saying the public are welcome. The Bureau system is as good as we can make it, and has not been a failure. We have given to the rest of the public the result of our experience, and I have no doubt thousands have benefited.

Mr. Neale (Wilson)—It would be better, instead of criticising a man because his fence is down, if those visiting his farm turned to and put his fence up for him.

Mr. McEwin (Port Wakefield)—We found it does a lot of good for the Bureau to visit a homestead. As to the usefulness of the Bureau, I think it is on the right lines. Everything rests with the members themselves. I think the Bureau has been a success, and if anything goes to prove it it is the large number of men who have attended this Congress.

The Chairman—There is a good deal in Mr. Kennedy's remarks. In our Bureau we did not make surprise visits; we visited by invitation. The farms were nicely prepared. The ladies took as much interest in it as the men. Mr. Lehmann's suggestions went further. In New Zealand I was present at a meeting of farmers, at which they discussed the markets and other things, and they arrived at a result satisfactory to all.

Mr. Brown (Port Elliot)—If the Chairman and Secretary of a Bureau cannot get subjects to discuss, the Bureau should arrange that every member must take part, either by reading a paper or initiating a discussion. If they will not do that you should turn them out. Our adoption of this system brought about better meetings and a better attendance.

TIMBER AND RAINFALL.

Question submitted by Boothby Branch—"Does the destruction of timber diminish the rainfall?"

Mr. Thomson (Quorn)—That has been proved by men of much greater ability than we can lay claim to. It is a waste of time to discuss it.

Mr. McEwin (Brinkworth)—I know I take an unpopular view on this question. I have been an observer and a student of the rainfall. I believe in planting timber, but not with the object of affecting the rainfall. Timber has no effect on the rainfall whatever. The rainfall for the last 40 years is published in the Journal for last January. In the district of the Burra the average appears to have increased by nearly an inch. The Burra country had not a stick of timber on it, and it has not a stick of timber now. We had the west coast with low-lying mallee. We had the Peninsula covered with bush. All the way from Inkerman and Balaklava, and towards Snowtown, we had the same. The greater portion of this timber has been destroyed, yet on those plains they are growing an average crop of 8 bushels to 10 bushels of wheat, and it is carrying 10 times more stock than when the timber existed. Did they ever have any timber in the north? The Government Geologist, reporting on Lake Eyre, said it was a great inland lake, and that it was covered with timber. The lake gradually dried up, and the timber died. That proves that the timber was not able to command the rainfall. In Queensland and the south-east, where they get 30 to 40 inches of rain, it is due to the proximity to large areas of ocean and to other causes, such as altitude, &c. Where they got this rain they had plenty of timber.

Mr. Blackham (Onetree Hill).—I don't think timber itself will induce rain, but it is a scientific question which only scientists should discuss.

Mr. Cornish (Gumeracha)—There is one thing that should be brought prominently before the authorities of this State, and that is the necessity for the planting of timber on a large scale. Too much timber is being removed from the land, and the District Councils should take steps to prevent such wholesale destruction.

Mr. Coleman (Saddleworth)—It is a very vexed question as to whether the trees follow the rainfall rather than the rainfall following the trees. Bundaleer and Jamestown were devoid of trees until the nursery was planted. I am not aware that there has been any appreciable difference in the rainfall since. I would like somebody to give us some information on that point.

Professor Perkins—We cannot expect a few hundred acres of trees to affect the rainfall of a whole country. What everybody maintains with regard to timber is that if you have a wooded country you get a slightly bigger rainfall. I think that it can be shown that large areas of forest country exercise an influence on the rainfall. I am not going back to the geological disturbances of centuries ago. We can find our proofs within historic times. We have evidence in the remains of enormous aqueducts that exist throughout the whole of North Africa erected 2,000 years ago, when the country was heavily wooded over the mountain ranges, that the rainfall was exceedingly heavy in those days. The vegetation in the hills has been repeatedly and purposely burnt over, with the result that their carrying capacity, as well as their growing capacity, has been reduced. We cannot gauge the effect of timber on our rainfall in a few years.

Mr. McEwin—I was speaking about the timbered country that had been cleared, and my remarks apply to 10 years ago.

Professor Perkins—I do not think Australia could ever have been considered a heavily timbered country. I do not think myself that by planting a few hundred acres you are going to affect the rainfall of the country.

The Chairman—I do not think any one has ever attempted to prove that an increase in the timber will increase the rainfall. What has been established is that timber will increase the humidity of the country.

DOCKING WHEAT.

Mr. Thompson (Quorn)—I have been asked by one of our members, Mr. C. H. Altmann, to bring forward the question of docking wheat. At present if wheat is 1 lb. under the standard the buyer will dock 1d. per bushel. With wheat at 2/6 per bushel this is an unfair amount. At that price the wheat 1 lb. under the standard should be docked say ½d. per bushel. When wheat was 3/6 per bushel make it ¾d., and when it fetches 5/ per bushel 1d. less for each pound under the standard.

Mr. Thompson moved to the effect that the present system of docking wheat under the standard was not fair to the farmers.

Mr. Jorgensen seconded. Motion was carried.

CLEARING FERTILISERS AT COUNTRY STATIONS.

Mr. W. H. Hawke (Arthurton) moved—"That it is desirable that the time allowed for clearing fertilisers at country stations be extended to 48 hours." It is desirable in the interests of farmers who live at considerable distances from the railway station, and who have only a bi-weekly or tri-weekly mail, that more than eight hours should be allowed for the removal of fertilisers.

It constantly happens that there are no means to notify the farmer of the arrival of the manure; the consequence is it is shifted about and causes a lot of trouble. I know some farmers who live 15 miles from the railway station, and their difficulty is considerable.

Mr. Jorgensen—Make it 24 hours.

Mr. Hawke—You get practically 11 hours now. The 48 hours should start from the time of the arrival of the train.

Mr. McEwin—I second the motion. It will be convenient for the man who lives some distance from the railway, because as it is now many of the farmers are placed at considerable disadvantage. I live alongside the railway, and I employ two men, and pay them 6/ for the unloading of the manure. I think two years ago the Commissioner said he would give consideration to this matter. The storage of the fertilisers does not put the Railways Commissioner to any great inconvenience. I think the limit should be made eight or nine miles from the station.

A Delegate—There ought not to be any limit at all.

Mr. McEwin—It is not a fair thing to make it 48 hours for every farmer, because some of them may be living close to the station. What I understand is that the motion is intended to remove difficulties for those farmers who live at a considerable distance from the railway station, and where the post office is at a considerable distance also. I urge that as far as possible we should seek to help the Commissioner, and not unnecessarily harass him. We must meet the Commissioner if we are going to ask him to meet us.

The Chairman—I suggest the motion might be altered to read as follows:—"That, for the convenience of farmers living at a distance from the railway station, the time for the storage of fertilisers on stations be extended from 8 to 48 hours."

Mr. Hawke—I agree to that.

Mr. Lehmann—I think the difficulty might be overcome by the agents. They should notify the date of the arrival of the manures.

Mr. Hawke—Last year, in connection with the Farmers' Union, I asked them to notify me by post of the probable date of the arrival of the manures. The postcard reached me the day after the arrival of the fertilisers at the railway station.

Mr. Lehmann—At Murray Bridge if you do not unload the manure there is a difficulty about trucks.

Mr. Brown—In our district we have an arrangement whereby the difficulty is overcome. I live within a mile of the town, and I act as agent for the manure sellers. They notify me of the date of the arrival of the manures, and I go down to the station, unload it, and notify the consignees. Of course I charge for my time. Some stationmasters allow a little latitude, but some won't.

Mr. Thompson—Less than 12 months ago a deputation waited on the Traffic Manager in reference to the subject. The answer then given was that if the farmers showed a reasonable excuse an extension of time for the storage of fertilisers would be allowed. In the circumstances perhaps it would be just as well to stay our hands a little. We might seek to get the advantage of the concession granted to us a year back. Business people are fond of saying that the farmers get too many concessions.

Mr. Jorgensen—We make our arrangements for the dispatch of telegrams when the manures arrive.

The motion was carried.

STUMPS IN MULLENISED LAND.

Mr. J. W. Dall (Nantawarra)—There is much land cleared of stumps. The plough has done a great deal towards clearing this land, but in many cases there are a lot of stumps left, which make it awkward to work and more costly than it need be. Since we have used larger ploughs much more of the ground is missed, as the stump lifts the plough out. I think the stumps would pay for the labour of grubbing, and at the same time it would help to keep the land clean, as the places missed are productive of weeds and rubbish. The advantages would be—We would miss less land; we would cheapen the working of the land; and we would be able to keep it much cleaner than it is at present. The grubbing would give labour to the unemployed, and the work would be remunerative, as the stumps could be sold.

Mr. Lehmann—We have the same trouble at Murray Bridge, and the farmers have undertaken to employ men to grub them up. We can put them on, and give them so much per ton to make something by selling the stumps, which are suitable for the Adelaide market. The big, spreading stumps are left in.

Mr. Hawke (Arthurton)—I am in sympathy with this suggestion, especially if it pays all expenses. It enables a farmer to keep men employed throughout the year.

THE F.A.Q. STANDARD.

Mr. Pontifex (Paskeville) introduced the subject of fixing the f.a.q. standard for the sale of wheat. He said the question of time in fixing the fair average quality standard has exercised the minds, not only of members of our branch, but the farmers of our district generally. The standard for 1901 was 63 ℔. of wheat to the bushel; but, on account of rust playing such havoc with last season's crop, the corn trade section of the Chamber of Commerce, after much delay, reduced the standard for 1902 to 62 ℔., or 1 ℔. less. The consequence was that all wheat not reaching the 63 ℔. sold before the middle of January had to submit to a reduction in price of 1d. per bushel for every pound below this weight. When the corn trade section decided upon 62 ℔. for their standard the majority of the wheatgrowers in the district in which I live had disposed of their wheat, thereby sustaining the loss of a penny per bushel. The Paskeville Branch suggested the idea of having three standards for South Australia, and if this is impracticable it may be possible to arrange some other plan, whereby a recurrence of so serious a loss to the producer may be prevented in future seasons. I move—"That this Congress is of opinion that it is desirable that the Agricultural Council approach the corn trade section of the Chamber of Commerce to fix the standard at the very earliest opportunity."

Mr. Coleman seconded the motion.

Mr. Brown (Port Elliot)—It is to our advantage to have the standard as high as possible, because merchants can sell better in London. They cannot fix a standard for the whole State early, because the crops in the south and south-east are late.

Mr. Manly (Balaklava)—The dissatisfaction last year was with the old standard of 63 ℔. The merchants got the wheat in early, and docked us 1d. per bushel for 62 ℔. samples; and then the standard was reduced to 62 ℔.

Mr. McEwin—Last year the fixing of the standard was very much delayed; but we are in the hands of the merchants. The men who kept their wheat back did well.

The motion was carried.

VOTES OF THANKS.

Mr. McEwin (Brinkworth)—I propose a hearty vote of thanks to the Chairman for the way he has conducted the meetings. They had been splendidly conducted. I wish to include in the motion Professor Perkins, Mr. Summers, and the press.

The motion was carried with acclamation; and the Chairman having brief replied the proceedings terminated.

AGRICULTURAL BUREAU CONFERENCES.

HILLS BRANCHES.

The seventh annual Conference of Hills branches was held at Forest Range on October 16. The following respectively represented their branches: — Messrs. Piggott, Wright, Payne, A. L., W. A., and H. Morphett (Clarendon); Hughes, Narroway, J. and W. Nichols, E. and T. Oinn (Mylor); Herring, McKinlay (Mt. Compass); Sandow, Grivell (Hahndorf); Keddie, Dragomuller (Woodside); Rogers, J., R., A., H., and F. Green, Plummer, Waters, Rowley, McLaren, Vickers, Townsend, and Monks (Forest Range); Miller and Vigar (Mt. Pleasant); Lee, Monfries, Cornish, Stevens, Bond, Hanna, Jamieson (Gumeracha); Hicks, Broadbent, Brumby, Jacobs, Ricks, J. and C. Lewis (Cherry Gardens); Molineux and Laffer (Council of Agriculture); Towar, Quinn, and Summers (Department of Agriculture); and about 20 visitors.

Mr. Monks (Chairman of Forest Range Branch) presided, and opened the meeting by welcoming the visitors.

Mr. J. Monfries read the following paper:—

POULTRY FOR FARMERS.

There is a great deal more in poultry than most farmers think. If you visit farms you will be shown the horses, cattle, and pigs, and you will be told what they are bred from, how they intend to improve the breed, and such like; but if you ask about the poultry you will be told—"Oh! bother them; they are a nuisance, and will not pay." And if you look around you will see a lot of small inbred, herring-gutted-looking things, neither good for table purposes nor fit to produce eggs. If the same attention were paid to the poultry that is bestowed on the cows, pigs, &c., they would, however, yield a good return. There are differences of opinion as to the best sort to keep, and a great deal depends on the climate and the locality. In a wet and cold district a heavy well-feathered fowl is required, as eggs cannot be produced there and made to pay like they can on the Peninsula or the Murray Flats, where it is a limestone country and warm. The best thing to do when near the city would be to breed for table purposes. It any one wished to go in for a breed to produce eggs alone the Orpington or Langshan is recommended, as they have been found to lay well both in the cold weather and in summer, and the chickens grow fast and strong. Then they were good birds to cross with for producing table birds. By introducing an Indian game rooster with the hens you will get fine birds, something to cut at, weighing when about eight or nine months old 10 lb. to 11 lb. The Orpingtons are to be preferred to the Langshan as they are clean legged. The Wyandottes have also been tried, and are considered a first-class fowl, both for laying and also for crossing. They are nice square thickset birds. A cross between the Wyandotte and Plymouth Rock had produced a good laying fowl and large. Their progeny crossed with a Langshan resulted in the best of them providing some of the best layers ever seen. It was possible to work up a laying strain with those fowls that it would be hard to beat; it would only be a matter of waiting and culling and breeding from the best layers. Another good cross for table and laying is the Indian game with Dorking hens. They were hardy, and grew well. Young roosters about nine months old would weigh 11 lb. to 12 lb., and birds of that description brought a good price in the market. It is better to breed a bird like this than it is to neglect the poultry and let them go on breeding in until you could not find a bird to kill that would scale 2 lb. Never be afraid to give a price for a good bird to cross with; and see that it is a pure bred one; you will be in pocket in the end. If some people are asked 20/ for a bird they think it a fabulous price, but it will pay if it is a good bird. Do not keep that bird too long; a change in the rooster should be made every two years; and do not keep the hens longer than two and a half years. Young hens will lay better than old ones. If you want to get eggs when they are dear, raise chickens as early as you can. The early chickens would grow the largest and strongest, and lay just when eggs were dearest. As regards fowls for laying, if it be a climate that is warm and dry go for Minorca or Wyandotte. Hamburgs were also good layers, but their eggs were small, and if one wanted to kill for the table they were too small. All poultry and eggs should be bought by the pound; this would induce people to produce a good heavy bird of good quality, and also eggs as well. Some of the eggs we see are hardly worth calling such, yet people get just as much a dozen for them as those who produce eggs twice as large. People have been heard of who carefully selected all the large eggs for themselves and sold the small ones, and who said, "Oh! we shall get just as much a dozen for the small ones as the large."

Mr. Hughes had been successful with Langshans as winter layers, but he was afraid they might fail him during the warm weather. Mr. Monfries did not think that he need have any fears on this score, providing he had secured a good laying strain. He strongly recommended Indian game crosses for table purposes. Mr. McLaren preferred the Orpington-Indian game. He had no doubt that the larger breeds would prove the best for our colder districts. Mr. Ricks regretted that the writer had not dealt with the financial aspect of poultry rearing. Mr. Monfries regretted that he had not kept proper accounts from which the profits of poultry-rearing could be derived. Dr. Stevens, speaking from experience, said he was certain that poultry rearing paid well even when all the food was purchased. Mr. Summers stated that from accounts kept for over a twelvemonth his fowls had cost about 3d. per month, and returned 6d., which represented a profit of 3/ per hen for the year; latterly owing to the rise in the price of foodstuffs the profit had only been 1½d., though the returns had averaged 7d. per month. With pollard and bran at 1/6 per bushel, and wheat at 5/, the returns from the poultry were equivalent to over 6/ per bushel on the wheat consumed. Mr. Molineux upheld the Dorkings as the best all round fowls, providing good strains were secured. Mr. Rogers stated that his fowls cost him 1d. per week, and that with eggs at 8d. he was able to realize a distinct profit. Mr. Kedzie realized from £4 to £5 per annum from 25 White Leghorns. He did not find breeding table fowls a paying game. Mr. Vigar had considerably improved his ordinary fowls by introducing from time to time Brown Leghorn, Dorking, and Orpington roosters. He frequently fed his fowls on boiled down rabbits, which he considered helped to considerably increase the return in eggs. The wheat screenings fed to his fowls realized something like 6/ per bushel. Mr. Rowley had been equally successful; he commended the Golden Wyandottes as layers for cold districts. Mr. Nicholls thought that much of the food given to poultry could be grown by poultry rearers themselves. He had done this with peas, which he fed to the fowls with satsfactory results. Mr. Miller found the White Leghorn the most profitable fowl to grow in his locality.

On a motion of Mr. Hughes it was resolved that poultry and eggs should be sold by weight.

Mr. G. Quinn (Horticultural Instructor) read a paper on

ARSENICAL SPRAYING.

He gave a short historical account of the use of arsenities for the destruction of insects attacking the fruit and foliage. The mixture which was likely to be generally adopted here, viz., arsenite of soda, was first suggested by Professor Kedzie, of Michigan, in 1897. He (Mr. Quinn) first used Paris Green in South Australia in 1894 at Hackney. Trees sprayed twice after the petals of the flowers had fallen kept their fruit fairly free from caterpillars until December; but after that they suffered severely, showing the necessity for additional treatment. The following year the fruit on trees sprayed five times was no freer from attack than the fruit on unsprayed trees. On having the Paris Green tested it was found to contain no arsenic whatever, and although this fact was made public it was conveniently overlooked by those who desired to disparage the tests carried out by the department. These trees were literally whitewashed with the lime-treacle wash, yet the insects attacked almost every fruit, showing conclusively that such a discoloration will not drive them to the fruits on unsprayed trees. In 1896 a small block of apple trees in the orchard of the Parkside Asylum was sprayed seven times with tested Paris Green, used at the rate of 1 oz. to 10 gallons of limewash. A hailstorm marred the exact results, but several trees had been picked before, and the results were very encouraging. In 1897 a larger block was secured, and experiments conducted at Marion, the results of which showed that 17 rows of trees sprayed with Paris Green had only 10 per cent. of the fruits affected, 4 rows sprayed with Kedzie's arsenite of soda—the first time of use in this State—carried only 5 per cent. of affected fruit, while 4 rows left unsprayed as checks had 42 per cent. of damaged fruit. He always took part in the actual work of applying these arsenical sprays, and never felt any ill effects. Samples of fruit from the Parkside and Marion experimental plots taken from the trees sprayed seven times and tested by the Government Analyst, showed that there were not sufficient quantities of arsenic remaining on them to injure the consumer. With reference to the mixing, he wished to impress on them the need for using lime which had not been air slaked, because if old lime was used the arsenic would not combine with it completely, and soluble arsenite of soda would be sprayed upon the trees, with the result that the foliage and fruit would be scorched. The lime should be slaked slowly, by adding small quantities of water until it had all crumbled to powder and given off its heat. It should then be thinned down with clean water and the sediment strained out of it. A good working practice was to take a barrel or vessel with a capacity equal to one gallon to each pound of lime slaked. The strained limewater should be placed in this, and the vessel filled up. In using, a gallon of that liquid was equivalent to 1 lb. of lime. In using arsenite of soda, to secure the change into arsenite of lime, which would not hurt the foliage, it should be poured into the strong limewater, and then the required quantity of clean water should be added to make up the spray. Bordeaux mixture could be used in combination with this spray, to check both the fusicladium and codlin moth. If he were going to make 40 gallons of Bordeaux mixture and arsenite he would dissolve the 4 lb. of bluestone by suspending it in a bag in cold water overnight. When dissolved enough water to make 18 gallons would be added. The strained milk of lime from 4 lb. of freshly slaked lime would then be placed in another vessel and diluted up to 18 gallons. These two, the bluestone water and the limewater, would then be mixed together. The pint of arsenite which had been poured into 4 gallons of strong milk of lime some time previously would then be stirred into the Bordeaux mixture. The wash would then contain an equivalent to 8 lb. of lime, 4 lb. of bluestone, 1 pint of arsenite of soda, and 40 gallons of water. A more effective Bordeaux mixture was secured by thus mixing the lime and bluestone liquids in a diluted form than if they were combined while in a concentrated state. The mixture should be kept stirred during the time of application. The first spraying should be given as soon as the fruits were set, the second from 9 to 12 days later, and a third about a fortnight later. Any further applications should be given according to the breeding habits of the codlin moth in the district, and to meet that difficulty every grower should study the habits of the pest in his locality. In respect to spray pumps, it was desirable to have one which would put on the spray in a short while, as windy or showery weather, which was prevalent at the time of the early spraying, was quite unsuitable for the work. The spray should be applied thoroughly, and it was necessary to see that every part of the fruits was coated. He advised gardeners who did not possess powerful pumps to spray a small portion of their orchards thoroughly by way of an object lesson. Through using stale lime or inefficient appliances, or to not applying the spray at the right stage of the growth of the fruits, many failures would result. He hoped that they would not be disheartened by such setbacks, because if they followed the principle laid down he was sure ultimate success would result. He advised them not to dispense with the bandages on the apple and pear trees because they were spraying with arsenities. The weather or careless work often discounted the value received from the spraying, consequently it was important to use all other supplementary means within their power to check this pest and save their fruits.

Mr. Molineux stated that he was certain that Mr. Crawford and himself had advocated the use of Paris green long before the date mentioned by Mr. Quinn. Mr. Quinn stated that he would not recommend arsenical spraying whilst the trees are in full bloom. He recommended to spray with Bordeaux mixture when the first blooms began to open. Mr. Grasby thought that it is better to get a fine spray by the use of a powerful pump rather than by having a nozzle with too fine an opening. In his opinion a small receptacle was to be preferred to a large one. Mr. Sandow did not think that the quantity of lime recommended by Mr. Quinn was sufficient; all the lime did not always dissolve, and the danger of scorching the foliage from the presence of free arsenic would not have been completely avoided. Mr. Laffer stated that so far as the codlin moth was concerned, the two most important sprayings should take place within the space of 10 or 14 days, and that consequently it was necessary to use a very powerful pump, so as to cover the whole orchard as rapidly as possible. It is essential to spray early apples before the calyx leaves closed over. He advised spraying when about three flowers in each cluster were well out. He indignantly refuted the insinuation that had been made that those advocating the enforcement of the codlin moth regulations were endeavouring to create a corner in the apple market. He asserted that they had in view solely the best interests of the State, and of those who earned their livelihood from the industry.

Next Conference.

It was resolved that next Conference should be held at Cherry Gardens.

Visit to Orchards.

The afternoon was spent in visiting a number of orchards. The Forest Range Valley is about 2½ miles in length, and is practically one continuous orchard. The hills, in their natural state, are heavily clothed with stringy bark (Eucalyptus obliqua) and scrub, and its conversion into orchards entails heavy labour and expense. The visitors were greatly pleased with the condition of the gardens, and the areas planted to raspberries and rhubarb caused much comment. Many matters of interest were seen, and Messrs. Quinn, Vickers, and other growers pointed out results of various practices adopted, and answered numerous questions dealing with spraying, grafting, pruning, &c. Special interest was shown in Mr. Vickers's spray pump, manufactured by the Douglas Pump Co., the ease with which it was worked and the force obtained caused much favourable comment. Messrs. Laffer and Sandow mentioned that they had been using similar pumps this season, and strongly recommended them. It was generally agreed that the gardens were a credit to the owners, and that the visit of inspection had been of great interest and much practical benefit to the visitors.

TREATMENT OF THE SOIL.

Professor Towar gave an address dealing with various matters connected with soil cultivation in districts with 30 to 35 in. rainfall.

As he did not know the district he would rather talk with the people than to them He had absorbed a great deal of information during the day. He felt that perhaps the methods of cultivation he had practised in the past were not applicable in this locality. Steam ploughs and improved cultivators in this country would be out of place. Cultivation, however, was looked upon formerly for preparing the land for the seed and keeping down weeds. Weeds were, however, looked upon now as a blessing rather than a curse. The careless man would not cultivate unless he had weeds to keep down, and when he does this he is doing more to improve the soil, and hold the moisture, and make it congenial to the crops. In soil—of the nature of which he had seen that day—in the United States with 35 inches of annual rainfall they first would provide the land with underdrainage. The slopes may have the appearance of carrying the water off, but he knew similar slopes where under drains were necessary. If you get 35 inches of rain, more is received on or into the soil than in America, as about 10 inches of the 35 they received fell when the ground was frozen, and it ran off the surface. The rain benefits the soil by bringing down elements of fertility from the atmosphere, and if drawn through the soil the condition of the soil is improved. A well-drained soil will keep the crops through a drought better than a badly drained soil. If a fairly wet soil without underdrainage be planted with crops it will be found that the roots will not go down into the soil where there is free water. A soil with 25 per cent. of water in it will not allow the air to circulate as it should for the proper aeration of the soil. If seeds are set on wet soils the roots will keep near the surface, and as the season progresses the dry weather acting on this surface causes the plants to suffer. In the United States, in the growing of Indian corn, this is noticed, and the planting is delayed till late, so that the soil may be sufficiently dry. In order to thrive the roots must go into the deeper soil and become established there to resist the drought. The later planted corn usually thrives best through the drought. Drained land can be worked at times when the undrained land cannot. Loads can be hauled over it more readily. It is better for your 35 inches of rain to be drawn through the soil, and not evaporated through the surface to bake and injure its texture. The evaporation of moisture causes the ground temperature to fall, and this is of great importance in the early spring, when we should avoid everything which tends to decrease the soil temperature. As the water passes down air follows, and improves the texture of the soil, making it more congenial to the plants. Underdrainage may, therefore, be considered necessary in heavy soils where 35 inches, or even less, rain fall annually. The next important item is ploughing. As far as he had observed the ploughing is not as deep here as he had been accustomed to see. In the United States the ploughing is done to a depth of 6 or 8 inches. In Jersey, they read, the ploughing often reaches a depth of from 10 to 16 inches, where the best root crops are grown. It is claimed that the root-feeding area of one acre is equal to that of two treated in the ordinary manner, and crops in proportion are raised. The ploughing in any locality will depend upon the texture of the soil, the kind of plough, and whether coarse manures are ploughed under. He believed in deep ploughing and turning under coarse herbage, which should be completely buried. The skim plough had been mentioned. He believed in the use of the skim plough where much herbage is turned under. By turning in coarse herbage or organic matter we recognise that we make a break between the furrow slice and the soil below. This disconnecting link must be destroyed, so as, if possible, to get the capillary action renewed again. To do this where the soil is not too wet we must follow the plough with the roller, and then harrow. It was not a bad idea to go over the field first with a spring-tooth cultivator ahead of the plough, thereby loosening a little of the surface of the ground, so that when the soil is turned over a little loose soil is between to form a connection with the furrow slice. Another reason for doing this. When the ground is beginning to dry you may want to plough, and before you have time to complete the field it may be too dry. By harrowing the field ahead of the plough the surface crust is broken and a soil mulch is made. By this means the drying out is delayed, and the ploughing of the field may be completed. In the United States, where oat stubbles are ploughed under when the ground is sown to wheat, this practice has increased the yield of wheat by 4 bushels to the acre. It may have a beneficial effect on the germination of weeds, and he intended to try it in connection with the poppy at the Agricultural College at Roseworthy. As soon as the field is cut for hay or silage he would put on the harrow to cover the poppy seeds, and try to induce them to grow. This may be repeated again, say in March, keeping the field like a summer fallow, though unploughed. Rolled ground should not remain long before harrowing, as the object of the rolling is to reunite the furrow slice with the subsoil, as it helps to bring back the moisture to the surface. A break in its escape should be made, however, near the surface by making a mulch with the harrow. This mulch must not be deeper than the seed is to be sown; the wheat requires a firm seed bed. A good farmed soil should be in such condition as to permit of the moisture from below rising to the level of the seed, but not further. All of the moisture comes into the plants through the roots, which must have access to moisture, and the air must not be admitted too freely or it will dry out the roots.

In planting seeds the depth of setting depends on the size of the particular seeds in question. The seed contains all the food requirements of the plant before it comes through the surface. Fine seeds, of course, require to be planted to a much lesser depth than such seeds as peas, beans, &c. If the crop needs cultivation while growing, the fact that stirring the surface will help to retain the moisture should be borne in mind. We have enough moisture to grow weeds, and we cultivate to destroy them. There is need for tilling the soil to hold the moisture which should not be allowed to pass off any more than possible. At Roseworthy he had had a piece of ground stirred up every two weeks since the middle of June. About a week ago a posthole was dug in this ground, and one was also dug on the opposite side of a path where there had been no cultivation during that time. In the cultivated plot the soil was moist enough to make a ball when squeezed, but from the hole on the opposite side it fell into dust when pressed. Since June 24 they had less than 2½ in. of rain on those plots, and one caught and held the moisture owing to stirring; the other allowed it to evaporate rapidly. Where there was so little rain it was necessary to try to hold some moisture over from one year to another in the soil so as to give the crops an early start. Such cultivation not only prevents too rapid surface evaporation, but it encourages the moisture to rise from below.

Respecting green manures, he believed some lands needed more organic matter in them. It did not appear to him to be advisable to burn the straw after the stripper. If not wise to plough it under straight away roll or drag it down and try to get it incorporated into the surface soil. Though slow to rot if ploughed under, and likely to keep the upper 6 in. too dry, it was not true economy to burn it away. A certain amount of this organic matter was necessary for the proper working of the bacteria in the soil. He had seen weeds familiar to him in their fields to-day just as they grew in the United States of America. He was pleased to hear them speak so highly of the peas, and it prompted him to say that this country was in need of a better acquaintance with some of the leguminous plants. The experiments with fertilisers carried out here had convinced him that it was not desirable yet to start using nitrogenous manures of a commercial kind; but he believed more will be gained from the growing of leguminous crops. They will not only add nitrogen to the soil, but the deep roots will go down into the ground and open it up for the use of other plants, and bring from the lower strata elements of fertility which the rains had washed down. He believed the animals needed more of this nitrogenous food. Hay made from the wheat—according to the standards figured out by scientific men—was not a balanced ration. Man craves for meat not because he likes meat, but because he needs the constituents it contains. One speaker this morning said he had got good returns by feeding fowls on peas; others spoke of like results by feeding them on rabbits. Peas and meat of rabbits contain food properties chemically similar. The products of the hen are feathers, meat, and eggs, all of which are highly nitrogenous, and she must have that in her foods. It is so with the horses in the fields. He thought generally their food was not well balanced. Their tissues are highly nitrogenous, and they need more than chaff and wheat, they need nitrogenous food also; bran and oats will help to supply this. He believed the horses did not do as much work as they should because of the method of feeding. The average farm horses of the United States of America were not better than those of South Australia, but in his opinion the farmer got more work out of them because they were fed on a better all-round ration. This was of course only an impression, and he hoped to test it here for himself.

Mr. Cornish spoke strongly in favour of under-drainage for the Gumeracha District. He found that in spite of heavy stocking under-drained land always carried an abundance of grass. He was certain from personal experience that many of the orchards on the hill slopes would benefit by under-draining. Mr. Molineux did not agree as to the advisability of ploughing in straw in dry districts; he thought it better to tread it down with stock and plough it in in the winter. Mr. Vickers agreed as to the necessity of under-drainage; in his land, however, he found that frequently the drains only affected the land a few feet on either side. He was under the impression that they were frequently guilty of over cultivating their land. This year he had allowed grass to grow in his orchard, and only ploughed it in a few weeks ago. Professor Towar said that Mr. Vickers's practice agreed with that in use in Michigan, where crimson clover is sown in the autumn and ploughed in in the early spring. Mr. Green also supported the practice of under-draining. Mr. Quinn referred to the beneficial effects of under-draining in Victoria. He felt convinced that it would be a useful practice even in a comparatively dry district, as it helped to store the moisture in the soil. Mr. Nicholls endorsed Professor Towar's remarks as to the value of leguminous crops towards increasing the fertility of the soil. Mr. Jamieson agreed that much of the land in the district required under-draining, but he was afraid the expense would be too great to render its application possible over large areas. Professor Towar thought that fairly deep surface drains might be made to rid the soil of much of its superfluous moisture. He did not think that wheat should be sown deeper than 2 in. He recommended for stumpy or stony ground what he termed "shoe drills," although he had not yet seen them in use here. Mr. Cornish recommended deep drains, he thought 5 ft. a satisfactory depth, and had always found shallow drills in the hills to be useless.

FARM MANAGEMENT.

Mr. Jamieson gave a short practical address on the "Management of farms." He dealt mainly with many sins of omission of farmers. He contrasted their treatment of the cow as compared with that of their horses. He maintained that whilst the horses were frequently well attended to the cow was generally neglected. They were rarely allowed suitable shelter, and as a result the cold weather brought on a reduction in the amount of milk supplied. He maintained that a cow that was kept warm in winter consumed less food, and gave a better flow of milk. He knew that farmers paying attention to this point in his district secured better results than those who left the cows exposed to the inclemency of the weather. He then referred to feeding in autumn and early winter. He strongly recommended ensilage, without which no dairy farm should be. He recommended cutting early the dirtiest crops by which means they both stored up food and cleaned the land. From personal experience he strongly recommended lucerne where ever it could be grown; it would supply an abundance of green fodder which would do much towards reducing troubles of the digestive organs, with which their stock were at present frequently affected. Land that had carried lucerne for several years could then with advantage revert to cereal crops. He also commended maize and sorghum for dairy cattle. He was also satisfied that manuring grazing land would soon be generally adopted. Where land was thickly timbered the grass could be improved, and its carrying capacity increased by a little judicious ringbarking. Harrowing grass land was a practice that he could recommend when the land had become trodden down too firmly by constant grazing. He thought farmers would partake of a more rational diet if they grew their own vegetables, and thus ate more vegetable food. He thought that most of the slip-pannels should give way to properly constructed gates.

Mr. Green supported what had been said in reference to manuring grass lands. Mr. Summers also supported the same question. He quoted many instances where the manures had proved a success during the present season. Where they had failed he attributed it to late application. Mr. Nicholls thought that timber should only be rung with great care; it is always necessary to leave a sufficient amount of shelter, particularly in frosty districts. Mr. Jamieson, in reply, stated that he did not advocate the indiscriminate cutting down of timber; only poor bad timber should be cut out where the grass is deficient.

APPLE GROWING.

Mr. P. Probert forwarded short paper on this subject. He advised growers to work their trees for themselves. Put in cuttings of Northern Spy, Winter Magetin, or Irish Peach in May; they will root readily, and the varieties required can be worked on the following year. If properly looked after the trees would be large enough to plant out the next season. When setting out the trees cut them hard back, and only allow three or four topmost shoots to grow. It takes two to plant a tree properly, one to hold the tree and the other to spread out the roots and pack with good soil. Do not plant too deeply; the crown roots should be close to the surface. A pot of water to each tree when planted was very necessary. On their hill slopes plant about 15 ft. apart, as the soil is too poor to grow large trees. By planting early and summer pruning it was possible to get the young trees as far advanced in one season as is usually the case in two under the ordinary system. Several members stated they found Northern Spy cuttings difficult to strike. Mr. Nicholls stated that at the typical orchard they rooted freely in a deep, moist, sandy soil. Sowing Northern Spy and Winter Magetin pips was suggested, but it was pointed out that the seedlings could not be depended upon as blight proof.

INTRODUCTION OF BANANAS.

Mr. Vickers said that five years ago at the Conference at Cherry Gardens, he called attention to the danger of the introduction of the fruitfly in bananas, but they were assured that the Department were taking all necessary precautions. There was, however, a feeling of uneasiness among fruitgrowers on this point, and the recent discovery of fruitfly at Fremantle in bananas which were landed at Port Adelaide and then reshipped showed that there was good reason for this feeling. He thought that the growers should move in the matter. Mr. Jamieson agreed that the danger was sufficiently manifest to warrant stringent measures to protect the fruitgrowing interests of South Australia. He moved:—"That this Conference strongly urges that the Department of Agriculture should look seriously into the matter of the importation of bananas with a view to the efficient protection of the fruitgrowing industry." Mr. Waters seconded the resolution, which was carried unanimously.

WET AND LIGHT-WEIGHT CHAFF.

Mr. F. Green referred to the practice of excessive damping of chaff to increase the weight, and referred to instances where the chaff had gone musty after keeping it for a week. Mr. Jamieson admitted that the question was of importance to the honest merchant as well as to the buyer. Another point was that of light weight bags. Chaffcutters were sometimes asked by certain dealers to put a ton into 56 bags, instead of the recognised quantity, viz., 50. Naturally these men could undersell by 1d. per bag the honest man, but as purchasers would persist in buying the cheaper chaff the rogues flourished. The remedy lay in the hands of the buyers; do not purchase from any dealer who sells at any time wet chaff or light weight chaff. There were plenty of honest men in the trade who were entitled to fair support. Other members agreed with Mr. Jamieson.

A comprehensive vote of thanks to those who had helped to make the Conference a success was carried unanimously, and closed the proceedings.

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AGRICULTURAL BUREAU REPORTS.

Burra, September 19.

Present—Messrs. Field (chair), McDonald, Needham, J. A. Arnold, and Harvey (Hon. Secretary).

Annual Congress.—Mr. McDonald gave a brief report on Congress deliberations, and the Chairman referred to his visit to the Roseworthy Agricultural College, pointing out that the experimental plots had failed owing to the deficiency in the rainfall.

Lipson, September 13.

Present—Messrs. McCullam (chair), Brougham, Provis, Thorpe, Carr, Brown, Wishart, Barraud (Hon. Secretary), and one visitor.

Lampas in Horses.—Mr. Provis recommended lancing the gums and rubbing into them six times, at intervals of two days, doses of common salt. [Care should be taken to give horses moist food after lancing.—Ed.]

Treatment of Harness.—Members thought that it was well to dress harness with Neatsfoot oil. Mr. Provis recommended to follow on the use of Neatsfoot oil on a riding saddle by rubbing over the white of an egg.

Shelter for Stock.—Mr. Brown read a paper on this subject. He considered that it was a matter of importance, and one which the farmers in the district have neglected. It was a mistake to destroy every acre of scrub in the paddocks; if a few clumps were left standing it would greatly benefit stock by shelter in the winter and shade in the summer months. It is common to see on the plains large paddocks fenced in without a hedge, tree, or bush of any kind; to keep stock in such places is, to say the least, cruel. The least that can be done is to erect sheds of rough timber, which can easily be obtained in this district. A better method, however, would be to gather all the stubble and stack in suitable places in the paddocks; in this case the stock could occasionally take some clean straw from the shed.

One Tree Hill, September 26.

Present—Messrs. Ifould (chair), Bowman, Smith, Thomas, and Clucas (Hon. Secretary).

Cheese Making v. Butter Making.—After some discussion members came to the conclusion that under favourable conditions cheese making was more profitable than butter making.

Dairying.—Members generally favoured the cross in preference to pure breeds. They recognised the difficulty of maintaining a continuity of quality. Favourable reference was made to the Shorthorn-Jersey cross. Special stress was laid on the absolute necessity of at all times possessing a pure-bred bull, whatever his breed.

Port Elliot, September 20.

Present—Messrs. J. McLeod (chair), H. Welch, H. Vannell, and J. Brown (Hon. Secretary).

Congress.—The Secretary reported on proceedings of Annual Congress.

Private Separators.—Mr. Welch called attention to reports from London correspondents of the daily press in reference to the bad effect the use of private separators was having on the quality of butter exported from Australia. The damage was attributed to the fact that cream in varying degrees of ripeness was mixed together.

Inkerman, September 16.

Present—Messrs. J. Simpson (chair), D. Fraser, R. Kennedy, C. H. Daniels, C. E. Daniel (Hon. Secretary), and two visitors.

Congress.- Delegates reported on proceedings of Annual Congress. They were particularly impressed with Professor Towar's address, and thought the Government had secured a worthy successor to Professor Lowrie. It was decided to dispense with postcard notices of meetings as far as possible, as suggested at the Officers' Conference.

Amyton, September 18.

Present—Messrs. Mills (chair), Kelly, Thomas, Gray, Gum, Hawke, Mullett (Hon. Secretary), and one visitor.

The Young Man on the Farm.—Mr. Gray read a paper on this subject. He said that it should be the aim of every young man on the farm, whether he be the farmer's son or an ordinary labourer, to acquire at some time or other a farm of his own. He then proceeded to review what he conceived should constitute rational training towards that end. He laid stress on the importance of a good elementary education, and from this point of view he thought that the State schools supplied all that was required. He thought, however, that every farmer's son who was able to do so should endeavour to get a more advanced form of training by attending the Agricultural College. He was afraid, however, that the outlay of £30 per year in this direction was beyond the reach of many farmers' sons. On the other hand he was certain that there are many persons who are well able to afford the cost of teaching, but who begrudged the loss of their sons' labour. He looked upon this policy as selfish and shortsighted. He was certain that farmers' sons would benefit by a stay at the college, as the general education given there was of an exceedingly practical nature, as evidenced by the satisfactory balance sheet they were able to publish a short time ago. He thought, too, that the young farmers soon would be able to acquire in this institution a certain amount of polish, which they would not otherwise have had the opportunity of obtaining. When a school or college course had been completed it is more difficult to lay down hard and fast rules in reference to the subsequent treatment of the farmer's son. Everything should be done to render country life as attractive to him as possible. Machinery and stock should be in good order, so that he may have a pride in working them, and working hours should be of reasonable length. He thought that for manual labour eight hours a day were sufficient, excepting harvest time, when as much as 10 and 11 hours are frequently necessary. For team work the hours may be longer, balanced by the comparative lightness of the work. His experience showed that horses should not be worked more than seven hours a day in the field, which means about 10 hours for the driver. He insisted on the absolute necessity of ascertaining the direction of the inclinations of the lads, but deprecated the practice of apprenticing a young man reared on the farm to a special trade, and then expect him to take up farming in four or five years' time. He thought the best practice consisted in bringing the son into commercial co-operation with the father at as early a date as possible. The son should be given a certain amount of responsibility in the work from the very outset, so that he may gradually be fitted to occupy a more important position. He pointed out that some farmers thought they had an absolute claim on their sons' labours up to the age of 21. He felt certain that this was a mistake, which frequently drove away the young men from rural pursuits. He thought it well that young men should be allowed reasonable wages as soon as they were able to earn them, and later to be taken into partnership with their father, thus giving them an interest in the farm, and making them work with better heart. The farmer should discuss with his son his plans, and follow his suggestions whenever they appear to him as likely to prove advantageous. If the son showed any special business capacity he should be allowed to transact a certain amount of the business of the farm, so as to enable him gradually to acquire self-reliance and judgment. He was of opinion that if the farmers' sons were treated on these lines they would acquire a liking for their work, and become well fitted to take the place of their parents, or to acquire new farms as time advances. He then proceeded to address some advice to young people living on the land. He was inclined to think that the numerous references that had been made to them at different times would tend to increase their self-importance. He hoped, therefore, that they would understand that what has been said in reference to them has been with the object of enabling them to lead a happy and independent life. He pointed out that the material and moral advantages of rural life, and that the young man should be able to put up with a few disadvantages that occasionally attended it. Recreation was necessary, he said, but should be only regarded as a means to an end. He was of the opinion that the hired farm labourer had also an opportunity of working himself up to the position of farmer. He thought that if he started at 15 or 16 he should be able to save £28 per annum, and allow £12 for dress and pocket money. In this way about £200 should be in the bank in about six or seven years, which would be sufficient to start him in a modest way. He eventually referred to the difficulty of securing suitable land in good agricultural areas. The north had failed, and the new lands to be opened up on the west coast and at Pinnaroo are under scrub, and were likely to prove expensive in clearing. He said that they could not afford to do any more experimenting after their experience in the north. They needed good land and a reliable rainfall. He feared that the repurchase system generally placed too high a price on the land, so that many of our settlers were seeking land in the other states and in South Africa. He expressed the hope that some of our landholders may prove sufficiently patriotic to let suitable settlers have land on reasonable terms.

Crystal Brook, September 20.

Present—Messrs. R. Pavy (chair), W. and A. Hamlyn, Venning, P. Pavy, Davidson, Hutchisson, Weston, Meill, Dabinett, and Symons (Hon. Secretary).

Manure Plots.—The committee reported that the results had not hitherto proved satisfactory, largely owing to the dry season.

Agricultural Show and College.—Mr. Venning reviewed briefly the question of agricultural shows, and gave some notes on his visit to the Roseworthy College. He pointed out that the main advantages to the farmer of local shows were the possibility of their becoming acquainted with various improvements in implements. The careful examination of the stock was also of benefit to the thoughtful farmer. He thought that the prizes given for stock at the country shows were generally too small. The exhibits of farm produce had also their educational value. He referred eulogistically to the Compressed Fodder Company recently brought into existence in the neighbourhood of Roseworthy. He commented on the poor appearance of the crops at the College and on the presence of poppy in the same crops. He thought that members should avoid introducing this weed into their district.

Redhill, September 24.

Present—Messrs. R. Seviour (chair), R. T. Nicholls, D. Steele, T. H. Torr, A. A. Robertson, A. E. Ladyman, F. Wheaton, D. Lithgow, J. N. Lithgow (Hon. Secretary), and three visitors.

Congress.—The Secretary gave an interesting report on proceedings of Annual Congress, and of the visit to the Roseworthy College Farm.

Stock at Roseworthy.—Members wished for information on the following points connected with sheep and pigs at the College Farm:—(a) In regard to lambs shown at the Adelaide Show, how many sheep to the acre were kept, and were they hand fed? (b) Are stud sheep for sale or hire bred at the College Farm? (c) Have the farm authorities good pigs for sale for breeding purposes; and, if so, at what prices? [(a) Sheep were not hand-fed, but no special record was kept of acreage, as the sheep are shifted from paddock to paddock. (b) Stud sheep for sale or hire are not reared at the College. (c) Berkshire pigs can be purchased from the College Farm at from £1 upwards for suckers.—Ed.]

Tatiara, September 20.

Present—Messrs. W. E. Fisher (chair), J. Rankine, R. Penny, H. Hughes, C. H. Wiese, and T. Stanton (Hon. Secretary).

Wild Poppy.—Mr. Fisher tabled specimen plant of wild poppy found growing in his garden, and referred to the damage done to the crops around Adelaide by this weed. Members considered it important that farmers should keep a good lookout for poppies, and destroy the plants before they can seed.

Congress.—The Chairman read Mr. Daniels' paper on "Robbers and Wasters on the Farm," and discussion ensued. Members agreed in the main with the writer of the paper. Discussion at next meeting to be on Mr. Trengove's paper on "Harvesting Wheat Crops."

Mount Bryan East, September 18.

Present—Messrs. A. F. Pohlner (chair), T. Wilks, E. S. Wilks, J. H. Teddy, W. Bryce, B. Dunstan, J. Honan (Hon. Secretary), and two visitors.

Sheep for Farmers.—Discussion took place on best breed of sheep for farmers. The majority of members favoured the merino for this district.

Drilling in Seed.—Mr. Bryce stated that he had drilled in his wheat crop "zig-zag," and only half the seed had germinated. He thought this due to the hind-drill banking up the other too much. Members wished to know whether members of other branches had any experience of the results of cross-drilling—i.e., drilling half the seed and manure in, and then drilling in the balance across the other.

Poppies and Stinkwort.—Members wished to know if the wild poppy was of any use as food for stock—[No.—Ed.]—and whether stinkwort had proved injurious to stock. [If eaten in small quantities when young and sappy, no harm may result, but losses have occurred from derangement of the digestive organs caused by eating matured stinkwort, which is very coarse and fibrous.—Ed.]

Poisonous Shrub.—Mr. Teddy tabled specimen of shrub which he believed to be poisonous. A cow was seen to eat part of the bush and almost immediately she had a fit, rolled about in great agony, and died shortly afterwards. [Specimen forwarded is Pittosporum phillyraeoides, which has always been regarded by stockmen as a very valuable standby for stock. In seasons of drought this bush is largely utilised for feeding sheep and cattle.—Ed.]

Richman's Creek, September 22.

Present—Messrs. W. Freebairn (chair), A. Knauerhase, J. H. Lehmann, F. Mattner, J. A. Knox, J. J. Searle, J. M. Kelly, P. J. O'Donohue, J. McSkimming, A. Nicholson, J. J. Gebert, J. McColl (Hon. Secretary), and one visitor.

Congress.—The Hon. Secretary reported on proceedings of Annual Congress, and referred specially to Professor Towar's address, and to papers on "Harvesting Wheat Crops," and "Robbers and Wasters on the Farm."

Rainfall and Wheat Yields.—Discussion was continued on paper read at previous meeting by Mr. McColl. Mr. O'Donohue had averaged only 4 bushels per acre over a period of 25 years, but his rainfall was considerably under that recorded by Mr. McColl. Mr. Mattner stated that his average farm crops on the plains during six years was only 2 bushels. Other members thought the difference in the yields recorded by Messrs. McColl and the average for the district was mainly due to the difference in the rainfall, but Mr. Lehmann thought that Messrs. McColl's methods of working the land should receive some of the credit. He had often noticed on land adjoining Messrs. McColl's that the returns were not equal to theirs.

Stock Complaints.—Mr. Lehmann tabled the following recipes, which he had tested and proved satisfactory:—To make carbolic salve dissolve 4 oz. beeswax and mix with a large bottle of salad oil; then add 1½ teaspoonfuls of carbolic acid, mixing thoroughly. For rheumatism take half a pint of vinegar, quarter pint turps, 1 oz. rock camphor, 1 oz. spirits of wine, and 3 tablespoonfuls of mustard. Mix all together and shake well before using.

Forster, September 27.

Present—Messrs. W. Johns (chair), A. Johns, F. Johns, S. Retallack, F. Fowill, and J. Johns (Hon. Secretary).

Poultry.—A discussion took place on keeping of poultry. The majority of the members favoured the Minorca and Leghorn breeds for laying purposes. Boiled hay chaff mixed with grain or soft food was recommended as an aid to digestion.

Rhine Villa, September 13.

Present—Messrs. G. A. Payne (chair), H. W. Payne, W. Farey, W. T. Vigar, and J. Vigar (Hon. Secretary).

Utilisation of Dry Country.—Mr. Farey read a paper on the utilisation of land outside Goyder's line of rainfall to the following effect:—

When we see a gathering of the rising generation, we cannot help wondering where we are going to settle them in this State, or whether we are rearing them for the benefit of the neighbouring States. There is a vast tract of country in South Australia where the rainfall averages from 5 in. to 10 in. per annum, and the question is, how shall this land be dealt with. The experience of the past has proved this class of country to be unsuitable for wheat growing., Settlers have, with the help of the Government and a generous public, held on year after year of drought in the hope of better seasons, which, however, have not come. The question now must be faced, as we cannot go on any longer as we have been going. It is difficult to altogether exclude politics in discussing this matter, as the Government is in most cases the landlord. The Land Act of last year showed that the Government were beginning to realise the requirements of the case. He agreed with Mr. Hahn, of Morgan Branch, that the blocks should be from 20 to 40 square miles in area, and the rent 5/ per mile. Some parts will not carry more than one large beast to 200 acres. Heavy stocking in the past has been a great mistake, and now the dingo is so troublesome that in much of the country sheep cannot be kept with safety. Cattle will do better, as they do not eat down so closely, and will also eat the taller bushes; if the rabbits are kept down and the land judiciously grazed with cattle the bushes will recover. Sheep may do all right in the hilly country where it is free from dogs. The land should not be cut up into too small paddocks. The holders should, however, be compelled to fence their lands. There should be as few Government roads as possible through the blocks, and on these, gates should be permitted, to save expense in fencing. Water is of the utmost importance. Where a good supply can be got by sinking the expenditure is warranted. Dams should be made where there is good catchment and holding ground. A few good concrete tanks will pay. His experience was that with a 6 in. rainfall he could conserve water for as much stock as the land will carry. It may pay to grow a little hay if good early rains are experienced; but wheat and hay should only be regarded as chance crops, to be grown when conditions were favourable. Much of the land that was otherwise of little value could, if let cheaply, be profitably occupied as a winter run by those having land in the hills.

Mundoora, September 19.

Present—Messrs. R. Harris (chair), J. Blake, W. J. Shearer, D. Owens, C. H. Button, F. X. Beck, J. P. Angley, and A. E. Gardiner (Hon. Secretary).

Congress.—Delegates reported on proceedings of Annual Congress with which they were well pleased. They thought, however, if the delegates would make themselves acquainted with the rules of debate time would be saved and more knowledge disseminated. Dealing with this point, the following resolution was carried:—"This Branch would recommend delegates attending the Congress to kindly consider the duty they owe to the Chairman, and to study the rules of debate, members believing that if this were done, more good would result from the Congress meetings."

Bute, September 15.

Present—Messrs. J. H. Brideson (chair), A. Cousins, A. Schroeter, S. Trengove, E. Ebsary, M. Stevens, D. McEvoy, and W. Sharman.

Congress.—Delegates reported on proceedings of Annual Congress, and discussion took place on some of the papers read. Mr. Schroeter doubted whether it was possible to start harvesting with a binder much earlier than with the stripper, as after the wheat had reached the dough stage it ripened very quickly. Delegates were much disappointed at the crops on Roseworthy College Farm, the presence of poppy and other weeds being commented on. The horse stock were considered good, but judging from the condition of the cribs they appeared to be given enough food at once to last all day. Cattle, sheep, and pigs were also well spoken of.

Elbow Hill, September 17.

Present—Messrs. F. J. Brooks (chair), C. G. Ward, H. Dunn, W. Ward, J. Rhen, W. Robertson, W. Tynan, S. Pike, J. Wake, J. Harvey, W. Spence, J. Ward, A. Glazbrook, G. Dunn (Hon. Secretary), and 10 visitors.

Dairy Cows.—Mr. C. G. Ward read a paper on the Best Dairy Cow for this district. He considered the Ayrshire or Jersey strains best, as they will produce the most butter on the least amount of feed. It was true that the Shorthorns would produce more beef—probably 1½ cwt. more at three years—but this extra return would not compensate for the difference in the milk yield. According to reliable American records four average Shorthorns will consume as much food as five Jerseys, and the latter would produce more butter than the former. On a vote being taken seven members favoured the Jersey and five for the Shorthorn-Jersey cross.

Farming.—Mr. Robertson read a paper on improved methods of farming. Taking a farm of 800 acres as a basis, he would divide this into 200-acre paddocks, crop only fallow and each paddock once in four years. This would give 200 acres each year, which if well prepared and manured with say 56 lb. of super per acre would in most seasons produce a satisfactory return. After reaping, the stubble should not be burnt off as it will come in very handy for stock, and when the season opens there will soon be good early feed here. They could not depend on wheat growing alone, but by this method they could combine grazing and wheat growing with satisfactory results. Treated in this way the land will always remain in good heart, the carrying capacity will gradually improve, and it will be possible to keep the wheat free from rubbish. This paper was well discussed. There was considerable difference of opinion as to the best time to fallow. The Chairman introduced discussion on Lessons from the Drought.

Angaston, September 27.

Present—Messrs. W. Sibley (chair), J. H. Snell, J. Heggie, R. Player, F. Thorne, A. Friend, P. Radford, J. Vaughan, F. Salter, A. Sibley, and E. S. Matthews (Hon. Secretary).

Congress.—Mr. Matthews reported on proceedings of Annual Congress.

Conference.—The Secretary reported that most of the Branches to whom he had written in connection with the forthcoming Conference on November 5 and 6 had promised to send delegates. Committees were appointed to make necessary arrangements for the Conference.

Hartley, September 19.

Present—Messrs. W. Klenke (chair), W. Kutzer, T. Jaensch, jun., W. Brook, J. Stanton, B. Wundersitz, J. Jaensch, H. Reimers, A. Stein (Hon. Secretary), and two visitors.

Manures for Wheat.—Discussion took place on the best manure to use in this district. Various brands of mineral super as well as bone super have given good results in this locality, and where tried side by side there has been little or no difference in the growth of the crop. The supers were generally most profitable on sandy soils, while Thomas Phosphate should only be applied to clay or heavy land. Mr. Klenke thought that if they continued to use super year after year on the same land they would soon impoverish the soil; to avoid this he advocated spelling and fallowing occasionally. Several members suggested the use of complete manure. Mr. Wundersitz had tried a dressing of stable manure before ploughing, and then super drilled in with the seed. He got a very heavy crop and a splendid growth of grass the following year. He believed this method would in the end prove most satisfactory in this district. Mr. Brook tabled samples of wheat from manured and unmanured plots. The former were strong and healthy, averaging six stools to the plant, while the unmanured plants were less than half as tall and averaged only three stools.

Dowlingville, September 19.

Present—Messrs. T. Illman (chair), R. A. Montgomery, J. Phelps, W. T. Holland, T. Kenny, J. T. Whittaker, F. Lock, (Hon. Secretary), and one visitor.

Harvesting Wheat Crops.—Discussion took place at previous meeting on paper by Mr. Montgomery on Waste of Wealth. The use of the header came in for much criticism, Mr. Whittaker said the header wasted too much grain. Mr. Phelps considered the extra expense involved in the use of the binder and header too great a tax on most farmers; the binder also removed too much of the natural feed from the paddock. Mr. Illman referred to heavy losses occasionally experienced through the ripe grain shaking out before they could reap it.

Drifting Fallow.—Mr. Whittaker read a paper dealing with the drifting of fallowed land in this locality. He suggested that farmers should not be allowed to fallow the land within several chains of all Government roads. If these strips of land were left unbroken they would to a great extent check the drift on to the roads. The obstruction to traffic was a serious matter. Sheaoaks might be planted on these strips of land; they would assist in stopping the drift and when grown would provide good summer fodder for stock. Mr. Montgomery considered the suggestion unworkable. Mr. Phelps advised keeping the sheep off the fallow when dry; the best time to put them on to eat the weeds was after a shower. With a return of moister seasons he thought there would be less trouble with the fallows drifting.

Hahndorf, September 20.

Present—Messrs. D. J. Byard (chair), H. Spoehr, C. Bom, F. H. Sonnemann, and P. Schubert (Hon. Secretary).

Spraying for Codlin Moth.—On September 6 Messrs. A. W. Dobbie & Co. gave a demonstration in the spraying of fruit trees at Hahndorf, there being over 30 persons present. Members were very favourably impressed with the thoroughness of the work done, and as a result several growers have purchased pumps with the intention of giving the arsenical sprays a fair trial.

Mylor, September 20.

Present—Messrs. J. Smith (chair), C. Neilson, T. G. Oinn, E. J. Oinn, T. J. Mundy, W. Bradley, W. J. Narroway, W. H. Hughes, W. G. Clough (Hon. Secretary), and two visitors.

Duck Breeding.—Mr. W. H. Hughes read a paper on this subject, to the following effect:—

Twelve months ago I read a paper on this subject, and on that occasion promised to report again after another year's experience. I still hold that the keeping of ducks for egg production for sale will not pay us under ordinary conditions, but when we remember that eight Rouen or Pekin-Aylesbury duck eggs will weigh 1½ lb., or half as much again as the same number of fowl's eggs, or runner duck eggs, it will be admitted that it will pay to keep a few birds for our own use. From June to December my nine ducks laid 1,090 eggs, or an average of 121 eggs each. For table purpose I find I can grow them to 6 lb. weight in 10 weeks, and although full of pin feathers, they give general satisfaction, and meet with ready sale at 4/6 per pair; in fact, there seems an almost unlimited market for such birds. I feed on the lines laid down in previous paper, using, however, crushed shells in winter instead of old mortar, as the latter gets sodden with very little wet. A careful account of all the food consumed was kept, and I find it costs me 3/ per pair to produce ducklings 10 weeks old on last season's prices. With wheat at 5/ to 5/3, and bran and pollard at 1/9 per bushel, however, the cost comes to 4/4, leaving a net profit of only 2d. per pair The dung is, I consider, of value sufficient to pay for the labour entailed in attending to the birds. While the price of meat and feed stuff is very high, there has been very little rise in the price of poultry, hence the small profit shown. After 10 weeks, a duckling does not grow anything like so rapidly in proportion to the food consumed. They put on weight quicker from eight weeks up to 10 weeks than at any other time. The Rouen ducklings sell just as readily as Pekins, and as they are hardier, I am crossing them with my Pekin-Aylesbury strains. These are laying better than last year, as although they commenced three weeks later, they have already passed last year's record to same date. Nine ducks have laid in all 462 eggs since July 10, giving an average of over 51 each in 72 days. I have given up the incubator, as I failed to get satisfactory results, and it was difficult to get a hen to take to incubated ducklings.

Mr. Neilson said ducks would pay all right if most of the feed was grown on their holdings, as it should be. Field peas would prove very useful. Some of the members found peas did not give such good results here as in other parts of the hills, but it was generally thought, if properly manured, they would do all right. Mr. Neilson agreed with Mr. Hughes that if well fed and attended to it would pay to breed ducklings for sale when eight to ten weeks old.

Greasy Heels.—In reply to questions as to remedy for greasy heels in horses, bathing with softsoap and water was recommended. [Give a few bran mashes to loosen the bowels; wash the heels daily with softsoap and warm water, taking care to dry thoroughly with a soft cloth. A little carbolic oil may be used with advantage. Give the animal a spell, if possible.—Ed.]

Norton's Summit, September 13.

Present—Messrs. J. Cowling (chair), J. Hank, A. Smith, H. Horsnell, C. Bishop, F. Pollard, and W. H. Osborne (Hon. Secretary).

Work of Branch.—Mr. Cowling was elected Chairman for ensuing year. It was decided to meet on the Friday before each full moon, and to strike off the roll any member absent from two consecutive meetings without apology. Nominations to fill vacancies in the membership roll were made, and the Chairman appealed to members to improve the usefulness of meetings by attending regularly and taking part in the work. It was decided to make an annual levy of 2/6 per member to meet current expenses.

Caltowie, September 16.

Present—Messrs. N. E. Hewett (chair), S. Wenham, L. Graham, A. Kerr, J. Potter, J. Neale, J. McCallum, J. Leahy, G. Petatz, F. Lehmann (Hon. Secretary), and three visitors.

Congress.—Delegates to Annual Congress reported on proceedings. Mr. Kerr thought Professor Towar touched a most important point when referring to the prices charged here for American implements. The farmers should combine, and see whether they could reduce the prices considerably. He also referred to the question of ploughing under green feed; under their conditions it was better to fallow as early as possible without waiting for the grass to grow. Some of the members did not agree with the method of harvesting advocated by Mr. Trengove, of Bute, in his paper.

Arthurton, September 18.

Present—Messrs. W. H. Hawke (chair), W. E. Hawke, J. B. Rowe, J. Pearson, M. Baldock, S. T. Lamshed, W. Short, and C. L. Palm (Hon. Secretary).

Field Trials.—Members favoured holding field trials of implements and shows of stock at Paskeville and Bute alternately.

Congress.—Delegates reported on proceedings of Annual Congress, and expressed pleasure at Professor Towar's address. They thought the Department had secured a gentleman well fitted for the position of Principal of the Agricultural College.

Rainfall.—Recorded at Tiparra.—For August, 1.10 in.; September (up to 18th), 0.98 in.; for year (to date), 10.89 in. At Winulta the records were:—0.89 in. for August, 0.90 in. for September, and a total of 10.58 in.

Naracoorte, September 9.

Present—Messrs. S. Schinckel (chair), F. Welcome, P. Anderson, G. Wardle, J. B. Bennett, A. Caldwell, and W. A. Terry (Hon. Secretary).

Utilisation of Land.—Considerable discussion took place on the division of the Narracoorte Estate, and the use to which the land could be put.

Farm Bookkeeping.—Mr. Terry gave an interesting demonstration with the aid of a blackboard of a system of bookkeeping suitable for farmers. It was important that farmers should keep proper accounts, and be able to tell where they were making profits and where were the losses. Careful bookkeeping would tend to make the farmer get the best value from his work, and showed where it was necessary to improve his practice.

Ploughing.—Mr. Schinckel said in report of previous meeting he was made to say that every plough should have a stumpjump attachment. What he said was that they should have a subsoiler attached on the stumpjump principle.

Tanunda, September 18.

Present—Messrs. Walden (chair), Graetz, Trimmer, and Heinemann (Hon. Secretary).

Native Birds.—Members complained of the wholesale destruction of useful birds. They thought the subject should be kept more prominently before the public, and that special attention should be given to it in the public schools, as they felt that schoolboys were the main culprits.

Pollenisation of Pear Flowers.—Mr. Heinemann read a paper on this subject, pointing out that certain varieties of pears were self-fertile whilst others were self-sterile. In conclusion, he recommended that as a rule orchards of mixed varieties should be planted, excepting where experience had shown that the varieties grown were perfectly self-fertile. When large blocks of one variety, after blossoming well for several years, failed to produce any fruit it is more than probable that this difficulty is due to the want of cross-pollenisation. Under the circumstances he recommended grafting in other varieties to supply foreign pollen. He strongly recommended to encourage the presence of bees in pear orchards, so as to ensure cross-fertilisation.

Paris Green and Codlin Moth.—Mr. Heinemann recommended the use of Paris Green, at the rate of 1 lb. mixed in 150 gallons of water, for treatment against codlin moth. He recommended the use of an amount of lime equal in weight to the Paris Green used. He thought that the large trees should not absorb more than 3 to 7 gallons of the mixture. The first spraying should be given a week within the falling of the blossoms; the second treatment just before the fruit turns down on the stem.

Gawler River, September 19.

Present—Messrs. Badman (chair), H. and F. Roediger, Hillier, Barrett, Day, Parker, Dawkins, Badcock, Winckel, Leak, and Bray (Hon. Secretary), and two visitors.

Selection of Wheat.—Mr. C. Leak read a paper advocating selection as a means of improving our wheat sample. New varieties should be sown first in small lots, so as to test their suitability to the district. He recommended the grading of the seed wheat so that none but plump grains should be sown. He preferred passing seed wheat through the header, as his experience had shown him that many grains were injured by the stripper. He thought that every farmer should seek to improve his seed by selecting systematically the finest heads in his crop. He also discussed the much vexed question of the standard bushel. After some discussion the following resolution was unanimously adopted:—"That this Bureau favours the use of the Imperial measure in testing the weight of wheat, and invites the co-operation of other Branches in agitating for this reform.

Angaston Conference.—Messrs. A. Bray, H. Roediger, and A. M. Dawkins were appointed delegates to the Angaston Conference.

Golden Grove, September 18.

Present—Messrs. R. Smith (chair), T. C. McPharlin, J. Ross, S. Milne, J. Woodhead, C. Angove, J. Rawlins, F. Buder, A. Harper, J. R. Coles (Hon. Secretary), and one visitor.

Long Feed for Horses.—Mr. Ross referred to statement at Congress by Mr. A. L. McEwin that long hay was to be preferred to chaff for feeding horses. His experience was the reverse; more work can be got out of horses fed on chaff than on hay, and as far as health of stock was concerned there was nothing to choose between the two.

Licensing of Stallions.—Mr. Ross initiated a discussion on this subject. He contended that the proposal would not in any way result in the improvement of horse stock, but would simply add to the expense of the breeder and would prevent many poor men from breeding horses. It was purely imagination to say that our draught stock were deteriorating. No competent veterinary could certify that any horse was fruitful and capable of getting sound stock. Most of the defects in horses could be traced to the dams, and very often the breeder was himself to blame if the foals are not good. Mr. McPharlin pointed out that while the defects in a mare could only be transmitted to a few foals, with the horse these bad influences were far-reaching. Mr. Angove agreed; like begets like, and while a good horse could be reasonably expected to throw good stock, it was out of the question to expect the progeny of an unsound or inferior horse to be different to their sire in these respects. Mr. Milne opposed the proposed licence, and considered that farm horses were quite as good now as formerly. The horses they used 30 years ago were heavier than they needed now, but the class of horse now bred was more active. If there was to be provision for examination of stallions why should not the mare be also examined. Members were about equally divided on the proposal for licensing of stallions.

Kanmantoo, September 17.

Present—Messrs. W. G. Mills (chair), F. Hair, E. Downing, R. H. Downing, and J. Downing (Hon. Secretary).

Wheat Experiments.—Mr. Hair reported that he had 12 acres sown with Ranjit wheat, the produce from a few seeds received from the Bureau three years ago. The crop was promising well, and as far as his experience went he considered that it was well suited to the district. Mr. Hair also reported on experiments with different quantities of super. used with wheat; where he applied it at the rate of 120 lb. per acre the crop was several inches higher than where only 100 lb. per acre had been used.

Holder, September 20.

Present—Messrs. J. Rowe (chair), J. Jones, S. Pickering, F. Starr, E. Jaeschke, J. Rossiter, H. Blizard, W. J. Green, F. G. Rogers, W. Tuck, C. H. Perry, J. J. Odgers (Hon. Secretary), and one visitor.

Congress.—Delegates reported on proceedings of Annual Congress, with special reference to Mr. Trengove's paper on "Harvesting Wheat Crops." They also were greatly taken with the compressed fodder exhibited at the Adelaide Show.

Petersburg, September 20.

Present—Messrs. Cadzow (chair), Bottrill, Earle, Smallacombe, Sambell, and Wilson (Hon. Secretary).

Business.—Mr. Bottrill read a paper on Congress, and visit to the Roseworthy Agricultural College.

Willunga, October 4.

Present—Messrs. T. Pengelley (chair), J. Binny, J. Valentine, J. A. Hughes, A. Slade, J. Malpas, W. J. Binney, J. Kernick, H. Richards, T. Atkinson, and E. M. Slade (Hon. Secretary).

Business.—Various papers read at Congress were discussed.

Meningie, October 11.

Present—Messrs Linn (chair), Ayres, Williams, Myren, May, Botten, Tiller, and Hacket (Hon. Secretary).

Business.—Mr. May tabled samples of barley and rye which were considered very creditable for the district. The rye was sown in April, and now measured 6 ft. 4 in.; a second growth where portion of the crop was cut measured 4 ft. 8 in.

Booleroo Centre, October 13.

Present—Messrs. Nottle (chair), Steven, Parsons, Sargent, Brooks, Clack, McMartin (Hon. Secretary), and four visitors.

Haymaking.—Mr. Sargent read an interesting paper on various matters connected with haymaking:—

> He said that the best time to cut hay was when the wheat had done flowering. If, however, he had a light crop he preferred cutting it a bit riper. He thought it was a mistake to wait until the grain had formed in the ear. The grain developed at the expense of the straw. He knew that it was a general practice here to cut hay too late. Hay cut early was, however, far better for the horses, and if at times it were not found to be sufficiently rich some bran or crushed wheat or oats could easily be fed with it. Hay should be stooked as soon as possible after it has been cut, so as to avoid bleaching. He also found that the oat grains fell into the middle of the sheaves when this was done, instead of falling on the ground, as is the case when the sheaves lie about too long. He reckoned that 12 to 20 sheaves were enough for a stook. They protected the hay better from the rain than larger ones. Stacking should not be started before a fortnight after cutting; otherwise the hay is likely to heat in the stack. He preferred making two or three small stacks to one large one. If you have one large stack, and have your harvesting operations interfered with by rain, you are frequently thrown out of work for over a week, whereas if you build small stacks you can start another one whilst the first one is drying. He thought it was a mistake to feed horses on hay chaff alone, and he strongly recommended the use of long hay. He preferred the hollow strawed wheats for hay to the solid straw. He indicated a simple way for estimating the amount of hay standing in the field. Put an even number of sheaves into the stooks, and then weigh half a dozen average stooks, and from the results you can easily arrive approximately at the amount of hay on the ground.

Some discussion followed this paper. Most members agreeing with Mr. Sargent's views on the matter. Some, however, preferred feeding their horses on hay that had reached a more advanced stage, particularly in the case of oaten hay, which was very bitter in the green stage.

Millicent, October 2.

Present—Messrs. S. J. Stuckey (chair), H. F. Holzgrefe, H. A. Stewart, B. Varcoe, H. Oberlander, A. E. J. Hutchesson, A. McRostie, and B. Crouch.

Grass Manuring.—Mr. Stewart reported having drilled one cwt. per acre of super on grass land and was satisfied that the improvement in the grass, which was very marked, would more than recompense him for the outlay.

Dehorning Cattle.—Mr. Holzgrefe reported that he found this operation made the bull much quieter and put a stop to his fence breaking. Mr. Stewart said that since the Holstein bull belonging to the Bureau had been deprived of his horns he was much quieter than formerly.

Lucindale, October 11.

Present—Messrs. Feuerheerdt (chair), Carmeichal, Robson, Matheson, Tavender, and Dutton (Hon. Secretary).

Business.—Purely formal business was transacted. Mr. Tavender reported that the experiments of the manuring of grass lands had not hitherto proved satisfactory, as there was practically no difference between the manured and unmanured plots. He attributed this to the fact that the manure was sown rather late, at the end of July, and that no heavy rains had fallen since.

Yankalilla, October 3.

Present—Messrs. Grundy (chair), Dennis, Crawford, Heggarton, Newbold, Gardner, MacMillan (Hon. Secretary), and two visitors.

Mixed Farming.—Mr. Dennis reported having obtained a three-ton yield from a plot dressed with lime and farmyard manure, whilst ordinary land only yielded half a ton. He recommended rotation of crops—for instance, peas, oats, wheat. He also recommended a more general cultivation of sunflowers.

Burra, October 10.

Present—Messrs. Field (chair), Needham, Flower, Scott, and Harvey (Hon. Secretary).

Disease in Cattle.—Mr. Needham attributed the recent losses of cattle at Spalding and Iron Mine to impaction and paralysis. He thought that this was brought about by the poor quality of the herbage. He recommended farmers to drench their cattle occasionally and at regular intervals.

Paskeville, October 11.

Present—Messrs. Goodall (chair), J. and S. Price, Pontifex, Koch, Wehr, Palm, Meier, Curnow, Norris, Hamilton, O'Grady (Hon. Secretary), and several visitors.

Working Fallows.—A discussion took place on the advantages of ploughing fallows as opposed to the usual scarifying and harrowing. Members did not appear to have acquired much practical experience in the matter. Some were able to quote experiments in which ploughed fallows gave better yields than where the land had simply been scarified. The impression appeared to prevail that in such matters one must be guided by circumstances. In certain cases a second ploughing may give useful results, but generally speaking the ordinary practice is most economical and effective.

Salting Hay.—The experience of various members tended to show that the salting of hay in the stack is a beneficial practice. The practice advocated was to dissolve the salt in water and moistening the sheaves as the stack was being built.

Port Broughton, October 13.

Present—Messrs. Pattingale (chair), Dolling, Button, Harford, Tonkin, Bates, Dennis, Excell, Gardiner, Dalby, and Barclay (Hon. Secretary).

Congress.—Mr. Tonkin reported on his visit to the Roseworthy Agricultural College, and reviewed the condition of the crops there.

Melon Pest.—Members reported that melons, marrows, and similar plants were attacked by an insect resembling a small spider, which appears to suck the sap, and destroy the plants. Insectibane and tobacco water have been used without result. [Unless specimens of the insect are sent for identification, it is impossible to advise treatment.—Ed.]

Quorn, October 18.

Present—Messrs. Thompson (chair), Rowe, Herde, Cook, Brewster, Walker, Noll (Hon. Secretary), and one visitor.

Congress.—The Chairman gave a lengthy and interesting report on the proceedings of the Annual Congress.

Annual Report.—The annual report furnished by the Hon. Secretary, showed that nine meetings were held during the year, with an average attendance of over eight members out of 11 on the roll. Seven papers were read, and good discussions on each took place. There was a balance in hand of £1 19/9, on "Contingent Fund." The officers were thanked for their services, and re-elected. It was decided that a list of dates of meetings for the year should be issued to each member.

Kingston, October 4.

Present—Messrs. Pinches (chair), Goode, McCulloch, Flint, Clarke, Pinkerton, Bird, Fraser, McBain, Wight (Hon. Secretary), and four visitors.

Rape.—Mr. Goode stated that he had rape three feet high, which he did not know what to do with, as the sheep would not eat it. He was recommended by Mr. Pinkerton to feed it down with crossbred wethers, and dry sheep instead of ewes and lambs. Other members thought that he should leave the sheep there until they ate it. Mr. Goode was afraid that his sheep would suffer from such treatment. Mr. Wight recommended converting it into ensilage.

Ornamental Tree Planting.—Mr. Clarke read a paper on his experience in this matter; he had planted blue, red, sugar, and yate gums, elms, cypress trees, tamarisks, and pines, and latterly some broadleaf wattle. His experience went to prove that these trees did not succeed except in some sheltered position, or where artificial protection was afforded them.

Disease in Pigs.—Mr. Pinkerton lost 24 pigs about two months old, during the last eight weeks. He found that they became more or less paralysed in the hind quarters, and die in from one to six weeks. Other members had experienced similar difficulties. [Sufficient particulars not given to show cause of trouble. Members would do well, however, to compare symptoms with those described in Journal of Agriculture for August, 1900, page 81.—Ed.]

Kapunda, October 4.

Present—Messrs. Teagle (chair), O'Dea, Weckert, Kerin, Flavel, Correll, Holthouse, Morris, Pascoe, and Harris (Hon. Secretary).

Congress.—Delegates reported on the proceedings of the Annual Congress, and considered the discussions were instructive. On the matter of breeding of horses, Mr. Holthouse favoured a tax on stallions.

Standard Sample of Wheat.—Mr. Teagle considered the system of docking was very unfair. Mr. Correll thought that all wheat should be cleaned up to the standard, and anything over should be paid extra for.

Orroroo, October 17.

Present—Messrs. Copley (chair), Matthews, Harding, Lillecrapp, Roberts, Moody, and Tapscott (Hon. Secretary).

Feed for Stock.—Discussion took place on the keeping alive of farm stock until rain falls, and there is green feed. The prospects in this district are exceptionally poor owing to the absence of rain, and most of the stock is already on the move southward for feed, and what are left will have to be shifted. It was generally agreed that each one would have to do the best he could in the present circumstances to secure food for his stock.

Brinkworth, October 17.

Present—Messrs. McEwin (chair), Jericho, Ottens, W. & H. Welke, Everett, Woolridge, Shepherd, Morrison, Stott (Hon. Secretary) and two visitors.

Conference of Northern Yorke's Peninsula Branches.—It was decided to hold this Conference on the second Wednesday of February next.

Congress.—Discussion on report by delegates at September meeting was brought forward. With reference to Mr. Trengove's paper on Harvesting Wheat Crops, Mr. Jericho questioned the price of straw at £2 per ton as exceptional seasons only brought that price. Mr. Morrison considered the paper as extreme in many ways. The prices quoted in some cases were too high, and others too low. Members agreed that the condition of the seasons alter everything. [The paper in question distinctly states that the figures apply to the special circumstances of last year. As a matter of fact the straw was valued at £2 per ton, while at various times since last harvest up to £3 10/ per ton could have been obtained.—Ed.]

Port Lincoln, October 17.

Present—Messrs. Laidlaw (chair), Bruce, Sullivan, Barraud, and Kinmont (Hon. Secretary).

Show.—As the harvest prospects were generally poor, it was decided to allow the matter of the Show to stand over.

Rolling and Harrowing.—Members decided to act on the advice of Professor Towar to roll and harrow on the same evening after ploughing.

Butter Factory.—The Secretary was instructed to obtain all information concerning the expense, &c., connected with proposal to start a butter factory in this district.

Wandearah, October 4.

Present—Messrs. Robertson (chair), Roberts, Stanley, Fuller, Munday, Halliday, Eagle, Hall, and Birks (Hon. Secretary), and two visitors.

Improvement of Draught Stock.—The Chairman drew attention to deterioration of draught stock in South Australia. He attributed it to the inferior class of brood mares kept on farms, and to the use of second rate entires that travelled the district, in search of money, and not of foals. He suggested that the difficulty might be overcome by adopting the co-operative principle. Farmers of definite districts should combine together and purchase first-class draught stallions, to be available for all those subscribing towards the purchase. After some discussion, members accepted Mr. Robertson's suggestion by a formal vote.

Officers' Conference.—Suggestions at the Officers' Conference were discussed and generally approved of.

One Tree Hill, October 17.

Present—Messrs. Hould (chair), Barritt, Blackham, G. Bowman, Flower, W. Kelly, and Clucas (Hon. Secretary).

Annual Report.—Twelve meetings held during the year, with an average attendance of 7.7 members. The retiring officers were thanked and re-elected.

Roadster Horses.—Report of discussion at Congress on this subject was criticised. The cross recommended, viz., blood horse to draught mare, was convenient, but uncertain as to type and quality of the progeny. A distinct class of roadster could be established in time in the same way as the hackney, American trotting horse, and other breeds had been made. The statement that the original "Fireaway" was a draught horse was controverted, and a member stated that this horse was distinctly a roadster. One member thought the introduction of the American trotting stallion would be of value to breeders of light horses. The infusion of Timor or Shetland pony strains in blood stock had resulted in increased stamina and activity.

Broad v. Narrow Tires.—Mr. Bowman called attention to article in The Australasian, with diagrams, illustrating the action of broad and narrow tires, and considerable discussion ensued. Apart from the question of lessened draught, there was the very important aspect of the effect on the roads. The maintenance of their roads was being forcibly brought under the notice of the ratepayers in the reduction of the road vote, and members thought the Government should provide for an increase in the width of tires stipulated in the Width of Tires Act. It was also highly desirable that the Act should be more strictly enforced, as at the present time overloading was the rule rather than the exception. Where there was much traffic, vigilance on the part of the Councils would soon check this evil. One member stated that the enforcement of the Act would not entail any hardship, as from his own experience he was convinced that overloading did not pay.

Feeding Sheep in Times of Drought.—Report on experiments in neighbouring States was discussed. Wheaten straw saturated in molasses and water had been found a very effectual standby; 4 oz. of maize for sheep distributed broadcast per day had served to keep the animals alive. It was pointed out that straw from the thresher was more readily consumed by stock than that from a stripped field. Mr. Barritt put 65 head of ewes and lambs for six weeks in a four-acre field of mustard, and found they had greatly improved.

Mount Gambier, October 11.

Present—Messrs. Mitchell (chair), Watson, Wilson, Wedd, Dyke, Barrows, Ruwoldt, and Lewis (Hon. Secretary).

Licensing Stallions.—Considerable discussion took place on Bill introduced into Parliament providing for the licensing of stallions. Exception was taken by some members to the omission of any provision for the veterinary examination of stallions, and also to the annual licence-fee to be charged. Some members doubted whether any good would result from the proposal, and a committee was finally appointed to wait on Mr. Livingstone, M.P., in reference to the Bill.

Congress.—Messrs. Dyke and Ruwoldt reported on proceedings of the Annual Congress, and on visit to Roseworthy and other places of interest.

Mount Pleasant, October 10.

Present—Messrs. Phillis (chair), P. and J. F. Miller, Thomson, Naismith, Drogemuller, Royal, Vigar, Giles (Hon. Secretary), and two visitors.

Grass Manure Tests.—In company with Mr. W. L. Summers (Inspector of Fertilisers), members inspected various plots of grass land manured by Mr. H. A. Giles. There were five plots in all, each of about two acres, the manure being drilled on the surface and chain harrowed about July 21. The inspection failed to reveal any noticeable difference between the manured and unmanured land. At the request of members, Mr. Summers explained the constituents of the different manures used, and the results of similar experiments in other districts. He attributed the want of result to the lateness of the application of the manure. In his opinion manuring grass land would pay, but it was important that the manure be worked into the soil before the grass has well started. Mr. Giles showed members various matters of interest on the farm, and called attention to crop of horse beans. These had done fairly well, but were showing brown patches on the leaves and stems. Some members thought it due to frost, but Mr. Summers attributed it to a fungus attack, and secured some plants for identification. [Mr. D. McAlpine, of Melbourne, states the disease is known as "Pea spot," and attacks various leguminous plants.—Ed.] Members reported that feed was fairly good, stock doing well, and crops healthy but backward. A good soaking rain would prove beneficial.

Caltowie, October 13.

Present—Messrs. Hewett (chair), Kerr, Petatz, Graham, Potter, McDonald, Jettner, Wenham, J. G. Lehmann, McCallum, F. Lehmann (Hon. Secretary), and three visitors.

Increasing Usefulness of Bureau.—Paper read at Congress was discussed at length. Mr. McCallum thought that experiments in such dry districts were of little use, and as far as attendance of members was concerned it was of little use holding meetings when they could not discuss anything to advantage. Mr. Kerr considered that much good would result if Mr. Summers' suggestions were carried out. He thought it was the members' duty to see that there was something practical to discuss at each meeting, and in the driest districts there was room for experimental work. Mr. Hewett did not agree with suggestion for regular programme; they would get on better by arranging business from one meeting to another.

Roadster Horses.—Mr. Kerr thought roadsters as a class were going back. He had bred them all ways, but it was a mistake to make extremes. A medium draught mare mated with a blood horse was, in his opinion, the best cross; he opposed the opposite cross advocated by Mr. McEwin, who was mistaken in claiming the original "Fireaway" as a draught. Mr. Graham saw no reason why they could not work up a distinct breed of roadsters, as had been done with other classes.

Swan Reach, October 18.

Present—Messrs. Brecht (chair), Arnold, Hecker, Brown, Zadow, Hasse, Fidge, Baker, Harris (Hon. Secretary), and one visitor.

Intense Cultivation.—Mr. Hecker read an article from October issue of Journal of Agriculture dealing with growing of summer crops with irrigation. His experience was that under intense cultivation they could get three good cuts of sorghum in a season, totalling 70 tons of green feed. Mr. Hasse had been unable to get anything like such a return; he found that there was only light growth after the first cut. Mr. Arnold had sown sorghum and irrigated it with the result that the land caked so hard that the plants were destroyed. He considered sunflowers a profitable crop; they grew well and stood the hot winds better than most summer crops.

Wilmington, October 15.

Present—Messrs Slee (chair), McLeod, Schuppan, Hannigan, Bischof. Lauterbach, Sullivan, Broadbent, Noll, Maslin, and Payne (Hon. Secretary).

Destruction of Locusts.—The Hon. Secretary reported having received from Mr. C. H. Tuckwell bulletins showing results secured in South Africa with poisoned baits for the destruction of locusts. Growing feed, or green stuff, was sprayed with arsenical mixture made by boiling 1 lb. arsenic, ½ lb. washing soda, and 5 lb. coarse sugar in 10 gallons of water. This was most effective against the young locusts before they were able to fly. A long discussion ensued, and the following resolution was carried:—"That while spraying with arsenic over the breeding grounds of the locusts at an early stage of their growth might be effectual, yet unless a law was passed to compel all landholders in affected districts to adopt this method its use by a few people would not accomplish much good." A vote of thanks was accorded to Mr. Tuckwell for his courtesy in placing the information before the members.

Robbers and Wasters.—Mr. Maslin read paper on this subject as read at Congress by Mr. C. E. Daniel, and also submitted his own list of what might be termed wasters on the farm, viz.:—Neglect to have machinery placed in proper state of repair until it is actually needed for use; neglect to roll land on which the crop is to be cut with the binder; insufficient shed room for implements; having all gelding horses on the farm instead of a few well-selected breeding mares; not having a small blacksmith shop on the farm; neglect to store up fodder in good seasons as a safeguard against dry years; keeping pigs in the fattening stye after they are fat and full grown; allowing the wheat or grass to grow right up to the boundary fence; keeping too many roosters with the laying hens; and, worst of all, the unworkable mortgage which too many farms have to carry. A lengthy discussion ensued, and Mr. Maslin's contention that the land along the boundary fence should be kept free from crop or grass was strongly endorsed, as was the keeping of a few good breeding mares.

Wandearah, October 14.

Present—Messrs Robertson (chair), Stanley, Davidson, Munday, Joyce, Fuller, Eagle, and Birks (Hon. Secretary).

Weeds.—Mr. Eagle initiated a discussion on this subject. He showed how many so-called weeds were the original source of certain commercial crops, the difference being due to selection, cultivation, and environment. Weeds were plants out of place; so-called weeds could be converted into use by ploughing under while green; those that rooted deeply opened up the soil and brought plant constituents to the surface to be available when the roots decayed as food for shallow rooting plants. Then the presence of weeds necessitated better working of the soil than might otherwise be the case; consequently the crop benefited indirectly from weeds.

Port Germein, October 11.

Present—Messrs. Stone (chair), Holman, Head, Thomson, Blesing, Deer, Thomas, Kingcome, Gluyas, and Steinthal (Hon. Secretary).

Congress.—Delegates reported on proceedings of Congress, and it was unanimously agreed that the delegates were justified in voting against the proposed increase of membership of the Branch Bureaux; also the suggestion that the elderly members should retire did not meet with approval.

Binder v. Stripper.—Mr. Stone read an interesting paper on this subject. It was agreed that during the ensuing twelve months each member should either read a paper or initiate a discussion on some practical agricultural matter.

Koolunga, October 16.

Present—Messrs. Butcher (chair), Shipway, Sandow, Butterfield, Jose, Atkinson, Pengilly, Lawry, Allen, Palmer, Aunger, Freeman, and Noack (Hon. Secretary).

Northern Conference.—Members favoured holding the Annual Conference of Northern Branches at Crystal Brook.

Wheat Experiments.—Mr. Pengilly tabled samples of Ranjit, Silver King, and Marshall's No. 3 wheats, which were carefully inspected by members. Ranjit was far the best of the three, and Marshall's No. 3 the worst; the latter was considered unsuitable for this district in dry seasons, at any rate.

Harvesting Wheat Crops.—Mr. Trengove's paper was read and discussed. Members thought some of the cases mentioned at Congress were extreme ones, and that the stripper was after all the most profitable means of harvesting. Members thought a farmer would be very lucky to obtain anything like £2 a ton for header straw. Mr. Daniels's paper on "Robbers and Wasters" was also discussed, and it was generally thought that while many of the ideas were all right in theory there was not much in them when looked at from the practical side. The intelligent farmer soon finds out the wasters, and as a rule is not slow in remedying them when desirable or possible.

Norton's Summit, October 17.

Present—Messrs. Giles (chair), Smith, Pollard, Hank, and Osborne (Hon. Secretary).

Apple Growing.—Mr. Pollard initiated a discussion on this subject, giving his experience during the past two years in the district. He positively affirmed that he could save 80 per cent. of his fruit from codlin moth without spraying; whether spraying with arsenical mixtures would save the remainder he was not prepared to say. He particularly desired to point out that the small undeveloped apples which fell early were great harbours for codlin moth. Unless the garden was kept clean it was impossible to pick all these up, consequently a great deal of work was rendered comparatively useless. The Chairman pointed out that it was unfair to spray only a portion of a garden, as the moth instinctively passed such trees in favour of the unsprayed trees, and thus gave an unfair advantage to spraying. [Mr. Quinn's failure at Hackney some years ago, due to the use of spurious Paris Green, is often quoted by the opponents of spraying. Although the fruits were thoroughly coated with lime, most of them were attacked by the caterpillar notwithstanding the presence of unsprayed trees near by. This experience does not bear out Mr. Giles's idea that the sprayed fruits would be instinctively left alone.—Ed.] Mr. Pollard thought growers should pay more attention to the varieties of apples not affected by "scab," as in his opinion this disease was more disastrous to growers than was codlin moth. Mr. Smith stated that he had a pear growing within a few yards of a drain carrying urine from the stables. For several years this tree had been affected by a black smutty growth which appeared to be a living insect. Spraying three times during the season with Bordeaux mixture had no effect.

Morphett Vale, October 7.

Present—Messrs. Goldsmith (chair), Bain, Depledge, Jones, Binney, McLeod, Hutchinson, Pocock, Perry, and Ross Reid (Hon. Secretary).

Farm Implements at Adelaide Show.—Members referred to the Triumph plough. They recommended its use for light sandy land, or for second ploughing in stiff soils. They did not think it suitable for working heavy soils. They agreed that the milking machine was likely to be used extensively in large dairies. It was pointed out as an objection to its use that it was difficult to know when to stop, and that it was likely to be detrimental to the cows if continued after they were well stripped.

Field Poppy.—A discussion on this weed took place. Members were of opinion that when the field was badly infested with poppies it should be left under grass for two or three years, by which time the poppies would have disappeared. Failing this the land, after being fallowed, should be sown early at the rate of 1½ to 2 bushels per acre, and harrow the crop as soon as the poppies appear. A second harrowing might be given shortly afterwards. If the crop is too forward feed it off with sheep and harrow twice as soon as the poppies appear above ground.

Black Rust.—Members noted the appearance of Black Rust (Urocystis occulta) in the district, and enquired whether its presence could be accounted for after several years' freedom from it. They would also like to know whether Black Rust affected wheat would be likely to give a rusty crop if sown. [The source of the infection of Black Rust has not, as far as we are aware, been satisfactorily worked out. Infection from the seed is not likely to occur, as wheat affected by Black Rust rarely comes into ear and never ripens its seed. It is more probable that infection of the soil takes place, as in the case of loose smut. Climatic conditions appear to have a certain amount of influence on the development of this disease, as it appears fairly abundant certain years whilst at others the crops are comparatively free from it. If infection of the seed is at any time feared pickling the seed as applied to bunt will in all probability prove equally satisfactory for Black Rust. This disease rarely affects many plants in the crop, and has, as a rule, very little influence on the general yield of a large paddock.—Ed.]

Mount Compass, October 11.

Present—Messrs H. McKinlay (chair), F. McKinlay, Slater, Herring, Jenken, Gowling, Cameron, Jacobs, C. S. Hancock, and A. J. Hancock (Hon. Secretary).

Onion Pests.—Mr. Slater reported that his onions were being damaged by two different kinds of insects, the attack being worse where the ground was loose.

Potatoes.—Mr. Slater read a paper on this subject. The growers here, like a good many others, had gone in for potato growing and gave little consideration as to the variety of potato, size, and kind of seed, best time to plant, how to cultivate the ground, &c. They also had a tendency to rely too much on the results of experiments and tests in other parts. In his opinion, however, they would have to settle these points for themselves, as the practice successful in one district would not necessarily be successful here. This applies to varieties to plant and manures to use, as well as to time of planting and method of cultivation. They should also try for themselves whether the setts should be cut or whole, also what size was best, and carefully note results for future guidance. To get reliable results it would be necessary to carry on the trials for several years, as one season's experience was not a safe guide. Then did it pay better to plant shallow and mould up, or plant deep and not mould. Mr. F. McKinlay would plant about 6 in. deep, and take care not to put the setts at the bottom of the furrow—say 2 in. up on the side of the upturned furrow. Mr. Herring favoured hilling, especially with early plants; it protected the tubers from insect attacks, and was an advantage when it came to digging the crop. Mr. Gowling did not believe in planting with the plough, but would dibb the setts in after ploughing the land. Mr. Jacobs stated that he planted this year 1¼ acres with Redskins; ¾ cwt. of setts were cut on the ground as planting progressed, with the result that 99 per cent. grew. The remainder were cut in the shed a few hours previous to planting, and of these the crop was a complete failure, hardly any growing. He could not account for these results.

Morgan, October 11.

Present—Messrs. Heinrich (chair), Pope, Bruhn, Wohling, Haupt, and Plummer (Hon. Secretary).

Farming in the Dry Districts.—Mr. Wohling read a paper suggesting the removal of the farmers from the outside country to land where the rainfall was more reliable. His idea was that each farmer should pay in certain amounts to a fund, and whenever there was a sufficient amount to advance to allow a farmer to take up land elsewhere it should be allotted by drawing for names. If a fund of this sort could be started the farmers would by degrees be able to get away from the drought stricken areas. Considerable discussion ensued.

Davenport, October 9.

Present—Messrs. Trembath (chair), Brown, Pybus, McDowell, McDonald, Hodshon, Tottman, and Lecky (Hon. Secretary).

Boys on the Farm.—Mr. McDonald read a paper on "Make Farm Life Attractive for the Boys." Often the boys tire of the hard work and monotony of farm life; and is it any wonder? They are taken from school as soon as they can drive a team, and often are expected to do nearly as much work as a man. Many receive nothing but the food and clothing, and have to go to their parents for any money they may require. If the boy is industrious, and takes an interest in his work, it will pay the farmer to allow them all the privileges they are entitled to. Do not keep them working without paying them; allow them time for recreation and sport; do not prevent the lads bringing their friends home occasionally. Then do not be afraid to let them know you appreciate their work; discuss with them when they are old enough the operations of the farm and the prospects of the season. Give them a pecuniary interest in some particular branch of the work—i.e., in the cows, pigs, sheep, poultry, &c., as the case may be. Afford them every opportunity of learning what will be useful to them; never allow them to be deprived of the benefits of education. Arrange the farm work to make it as easy and pleasant as possible. Have a system about your work, and you will find it will make all the difference in the interest taken by the boys in their work. In his opinion the farmers themselves were often largely responsible for the desire of the lads to get away from the farm. Members generally agreed with Mr. McDonald in his claims for more consideration for the boy on the farm. Mr. Hodshon read Mr. Dall's paper on "Apprentices on the Farm," and this caused an interesting discussion.

Clarendon, October 18.

Present—Messrs. Piggott (chair), Payne, Spencer, Hilton, Juers, Pelling, W. A. and A. L. Morphett, Spencer, Dunmill, and Wright (Acting Secretary).

Rabbits.—Discussion on prevalence of rabbits took place, it being generally agreed that they were not so numerous this year as formerly.

Settlement on the Land.—One of the members reported that the committee appointed by the Branch to purchase for the lessees and others a large estate in the district had been successful in their efforts, and the land in question was now held by 18 residents instead of by one absentee.

Ensilage.—Mr. J. P. Juers read a paper on this. The silo was essential to successful dairying, as it preserved the feed in green, succulent, wholesome condition for an indefinite time. Any green vegetation that stock will eat can be made into ensilage, but the better the raw material the better value was the ensilage. Maize and sorghum chaffed into the pit were probably the best, and as under suitable conditions they would yield heavily dairymen would do well to grow them. The crop should be cut when the grain is in the dough stage. Sweet ensilage is generally considered best for dairy cattle.

Port Elliot, October 18.

Present—Messrs. McLeod (chair), Hutchinson, Inglis, W. E. and W. Hargreaves, Coote, Green, Gosden, Pannel, and Brown (Hon. Secretary).

Season.—Members reported that both crops and grass were suffering for lack of rain; the record on the plains being only 11 in. to date.

Cocky Chaff for Sheep.—Mr. Gosden stated that at Towitta he was feeding his sheep on cocky chaff in troughs with very satisfactory results; he had the best cut of wool for any time during the past seven years.

Manuring.—Mr. Brown read a paper dealing with the treatment of the so-called wornout land where the rainfall was from 15 in. to 20 in. per annum. After much experiment and careful observation he concluded that he must use something more than super at the rate of 120 lb. per acre, and guano at 2 cwt. per acre. He believed it would pay him better to apply more manure for a time at least, but the difficult point to settle was which was the most profitable to apply. It will require a lot of experimental work before a satisfactory answer to this question is obtained. He had a field of wheat all put in this year, with 120 lb. of super per acre, and it presents quite a number of interesting problems or object lessons. The portion in grass last year carries barely half the crop the piece that is now carrying the fourth wheat crop in succession, receiving last year 100 lb. per acre. On about three acres where peas were drilled in last year with 100 lb. guano per acre there is twice as much growth as on any other part, but where peas were broadcasted without manure there is little if any improvement over the rest of the field. On the portion of the land in wheat last year the straw was raked into heaps and burnt, and on these patches there is twice as much crop as on the land alongside. From present appearances the whole field will yield a payable crop, but what is of importance to him was what manure would have made all of the field equal to the best. Professor Towar says he believes our soils want humus; the benefit derived by wheat after peas seemed to imply that nitrogen was needed, while the result where the straw was burnt makes it appear that potash is also required. [There are two points that should be noted; the effect of peas is to add humus as well as nitrogen, and to affect the soil in other ways; burning the straw adds lime as well as potash, probably ten times as much lime as potash, to the soil, besides causing certain changes in the upper layers due to the heat. The whole effect on the crop cannot therefore be put down merely to the nitrogen or potash added by the two practices.—Ed.] If these constituents required to be added to the soil in addition to phosphates, the sooner they found out to what extent they were wanted the better for themselves. To carry out reliable series of tests, the land to be utilized must be clean, of even quality, receive the same treatment for at least one year previous to the test, and be in good condition generally. A good rust resistant wheat should be sown, and the crop from each plot carefully harvested and weighed. If they required humus they could not make enough farmyard manure, especially where the land is cropped nearly every year. By sowing oats, barley, or peas early in the season and ploughing the crops under in August, and then crop with peas they should add a good supply of humus as well as nitrogen, and have the land in good heart for a wheat crop the following year. Potash, phosphates, or nitrogen can of course be supplied by means of commercial manures, and they should try plots with phosphate alone, with phosphate and nitrogen, with phosphate and potash, and with all three constituents as well. Members generally agreed that careful experiments in this direction were necessary.

Saddleworth, October 17.

Present—Messrs. Frost (chair), Adams, Bee, Benger, Daley, Eckermann, Hannaford, Heaslip, Neill, Plant, Waddy, and Coleman (Hon. Secretary), and two visitors.

Visit by Professor Towar.—During the day Professor Towar inspected various portions of the district, and in the evening addressed a representative gathering of farmers and others. He said that the crops he had witnessed that day were, he believed, the best of any he had seen in this State. He wished as much as possible to pick up points and information which he could use in other parts of the State. It paid to have crops growing on the soil as continuously as possible, for by means of growing plants the hard mineral matter was gradually eaten away and made available as plant food. Soluble phosphates gave the wheat plant such a start that it was able to break down and feed on the insoluble material. Such crops as he had seen that day would contain three or four times as much phosphoric acid as that supplied as fertiliser. If farmers properly cultivated they could ensure to a large extent the proper amount of moisture. By ploughing when wet, and packing back the soil again by rolling, and then harrowing the surface to keep a loose dust blanket on top, moisture might be conserved from one season till next year for the wheat plant. Harrowing the surface before ploughing had proved an advantage in conserving moisture. Leaving the straw evenly distributed on the wheat paddock was a good thing. It supplied humus, and greatly decreased the evaporating power of the wind. The effect of a light board fence could be traced 200 ft. away in reduced evaporation. Even the harrowing of the ground after rolling would lessen the evaporative power. The most that could be made from stable manure was to apply it directly and while fresh to the paddock. There were good reasons for underdraining even dry soils, and where the ground was liable to wash out in creeks or much water flowed over the surface he believed it would pay to do so. Two inches was a good depth to sow wheat. It was good practice to harrow growing crops, either wheat crops or such crops as sorghum and peas. If the fertilisers were drilled in say a week before the seed he believed the result would be better.

Nantawarra, October 15.

Present—Messrs. Dall (chair), Nicholls, Dixon, Belling, Sleep, Uppill, and Spencer (Hon. Secretary).

Soil Moisture.—Mr. Nicholls initiated discussion on "How to increase the reserve of moisture in the soil." In this locality, where only 7 in. of rain had fallen since May 1, it was surprising to see how well some of the crops were looking, particularly where the land had been thoroughly cultivated. He considered that the moisture in the fields must have been stored from the previous season, and thorough cultivation was the means by which it had been so stored. There were two neighbouring fields, both of which had been fallowed last year, one being worked well, and the other left through the summer. On the former there was a good crop, while on the latter it was only fair. Near Kulpara there was a big paddock under crop, and the farmer in going to and fro, had given one strip about two chains wide an extra working each time; in the crop to-day this strip could be distinctly traced by the extra growth. Some years ago in a comparatively dry season he got three bags per acre off well-worked fallow, while his neighbour on similar soil ploughed just before seeding only got two bushels per acre. He advocated fallowing in June or July, twice cross-harrowing in August, and cultivating at least once in September and October, with a narrow tined cultivator. Mr. Dixon agreed in the main with Mr. Nicholls, so far as heavy land was concerned, but the treatment of light soils puzzled him. The Hon. Secretary read from the Australian Gardener an article dealing with the effect of tillage on soil moisture, and members agreed that under certain conditions the soil would abstract moisture from the air. Mr. Dall advocated better working of the land; he found that fixing one set of harrows immediately behind another set did just as good work as twice harrowing. Mr. Billing was opposed to deep ploughing; on his land he found it unprofitable. Scrub land should not be ploughed more than 3½ in., and on better soil say 4½ in., in this district was enough. All members were agreed that in small garden plots thorough cultivation caused the retention of moisture, and the question naturally arose why should not the same result be secured on larger areas. A majority of members present supported the following resolution:—"That in the opinion of this Branch, to secure the best results after ploughing the land well—as a general rule each farmer must exercise his own judgment on this point—it should receive two harrowings and two cultivations."

Strathalbyn, October 20.

Present—Messrs. M. Rankine (chair), Gooch, McAnaney, Michelmore, Mules, A. Rankine, Cockburn, Reid, and Cheriton (Hon. Secretary).

Application of Stable Manure.—Professor Towar's views that best results were secured by putting stable manure on the land fresh was discussed at length, and the following resolution carried:—"In the opinion of this Bureau it is more profitable and desirable to heap or pit manure, and to preserve the ammonia by covering the manure with earth or mixing it with gypsum, thereby destroying the seeds of weeds, which would otherwise be carried on to the land."

Mount Remarkable, October 16.

Present—Messrs. Jorgensen (chair), Lange, Foot, Yates, McIntosh, Morrell, Grant, and O'Connell (Hon. Secretary).

Congress.—Delegates reported on procedings of Annual Congress and matters of interest at the Adelaide Show.

Home-made Haimes.—The Chairman tabled pair of haimes made by himself from an old buggy wheel tire. Members were of opinion that with a few slight alterations and improvements the haimes would prove more serviceable than the ordinary haimes.

Cherry Gardens, October 22.

Present—Messrs. Burpee (chair), Jacobs, C. and J. Lewis, Brumby, Woods, Hicks, Potter, and Ricks (Hon. Secretary).

Pruning Wattles.—In reply to question, most of the members were of opinion that it would pay to prune wattles to encourage vigorous growth.

Branch Show.—A committee was appointed to make arrangements for annual show of products next March.

Holder, October 11.

Present—Messrs. Rowe (chair), Rossiter, Blizard, Tuck, Jaeschke, Starr, Green, Pickering, Stewart, Perry, Wood, Jones, Odgers (Hon. Secretary), and three visitors.

Dry Season.—Mr. Rogers tabled grains of wheat sown in April, only one grain of which had germinated.

Lucerne.—Members wished to know best commercial manure for lucerne. [Will depend largely upon soil and other conditions. Where irrigated, probably a rich bone manure or bonedust with nitrogen added will give good results. There is plenty of room for experiment in this direction.—Ed.]

Utilisation of Land.—Mr. Grant read a paper on the best use to make of their blocks to the following effect:—

They must first realize that they should not put all their eggs in one basket. With their facilities for raising water it was not possible for them to compete with Renmark and Mildura fruits, and while their trees were coming into bearing they must attend to other things. Wherever there is water for irrigation there was always a certain amount of food that could be grown to feed a cow or two, which properly cared for would provide milk and butter for the household as well as for sale. The skim milk would go a good way towards feeding pigs. Pigs of the right sort would prove most profitable on the blocks. Two or three good breeding sows would prove a profitable source of income. Maize was one of the best of grain feeds for pigs, and could be grown between the rows of trees. Every blocker should keep 12 to 24 fowls, but not more. A dozen hens properly looked after will be more profitable than 50 not attended to as they should be. Then a lucerne plot was indispensable for horses, cows, pigs, and poultry. Then, in regard to vegetables, it does not pay them to grow more than they could consume of cabbage, carrot, and potatoes, as they take a lot of water. Onions can, however, be grown with less moisture, and good crops produced on the flats. With vines and trees the chief thing when young was to keep them vigorous and of good shape. If a grower is not sufficiently versed in the art of pruning he should employ a competent man to do this when the trees are young. Once they are well shaped and in bearing a little commonsense and observation will show the grower what is necessary. In this locality it is not advisable to keep the whole block cultivated; the winds are very strong, and time after time he had had the young shoots cut, trees half-buried, and channels filled with sand on the cultivated areas. Get a good breakwind of sugar gums, almonds, or tamarisk; the latter was, in his experience, the worst robber of the ground. Cultivate around the trees and vines, and leave the rest of the land undisturbed. When the trees are well established, the plough can be used to a greater extent. Accounts of the various industries should be kept, so that the blocker knows what things pay to produce and what are unprofitable. Finally, the grower must look on the bright side of things; a 10-acre block kept in proper order will take all a man's time, and there is nothing worse for him than looking for failures.

Mannum, October 17.

Present—Messrs. Schulze (chair), Walker, Baseby, R. P. and J. L. Scott, Haby, and Wilson (Hon. Secretary), and one visitor.

Horsebreeding.—Discussion took place on report of Congress discussion on this subject. For roadsters the majority favoured mating a blood stallion with a medium draught mare. It was agreed that the roadster horse should not be used for breeding purposes. Some of the members disputed the statement that Fireaway was a draught stallion. In regard to feeding farm horses members agreed that it was best to give short feed in the day time and long hay at night.

Crystal Brook, October 18.

Present—Messrs. R. Pavy (chair), Morrish, Hutchison, Hamlyn, Venning, G. M. and G. Davidson, Weston, and Symons (Hon. Secretary).

Congress.—Delegates reported on proceedings of Annual Congress. Replies were received from several Branches in reference to proposal to hold the Annual Conference at Crystal Brook next year.

Wheat Experiments.—The Chairman tabled Early Para, Gluyas, Baroota Wonder, and Petatz Surprise wheats; Gluyas looked best, and Early Para next.

Harvesting Wheat Crops.—Mr. Morrish read a paper on this subject. The best method of harvesting the crop was the one that enabled the farmer to make the most of it at the least expense. In the north they all now recognise the necessity for saving straw and cocky chaff whenever the crops permit. This point has much to do with the question of the best means of harvesting. In his opinion on most farms the binder and header and the stripper and winnower were all required. Economy in the purchase of implements was most essential, especially where the crops were so uncertain, but the binder and header were in his opinion indispensable. They could start with the binder a full week or ten days earlier than with the stripper, and in this time could harvest enough to give a good stack of sheaved straw for the use of stock. His experience of the combined harvester was not sufficient to give a positive opinion on it, but it seemed to possess several disadvantages. In the first place the number of horses required to work it rendered it cumbersome; the chaff was left in small heaps in the field, liable to be blown away or spoilt by rain; the bags of wheat must be left all over the paddock, and there is loss of weight from exposure. Looking all round, he did not think there was any more profitable method of harvesting the crop than to cut some of it early with the binder, for heading afterwards, and strip the balance of the crop.

Baroota Whim, October 18.

Present—Messrs. Flugge (chair), Bessen, Spencer, Brideson, and Hoskin (Hon. Secretary).

Congress.—Delegates reported on proceedings of Annual Congress.

Licensing Stallions.—Members were opposed to this proposal.

Season.—Members reported that the wheat crops were not yielding as well as expected, owing to the hot winds causing the grain to shrivel.

Eudunda, October 13.

Present—Messrs. Gosling (chair), Pfitzner, Kluske, Paech, and Marshall (Hon. Secretary).

Annual Report.—Twelve meetings held during the year, with an average attendance of seven members. Three papers had been read, and a fair number of visitors had attended the meetings. The experimental plot was last year devoted to different kinds of wheats, 32 acres in all being occupied. This present season the branch is conducting experiments with 10 different manures, supplied by the Department of Agriculture. Messrs. A. E. Gosling, von Bertouch, and W. H. Marshall were elected Chairman, Vice-Chairman, and Hon, Secretary respectively for ensuing year.

Rusty Crops and the Binder.—The Hon. Secretary called attention to experience of many farmers in the cutting of rusty crops with the binder. Where the disease had not already affected the grain cutting seemed to entirely stop its progress. Rusty crops cut in the dough stage had yielded good grain, while similar crops left for stripping had suffered severely.

Port Pirie, October 11.

Present—Messrs. Johns (chair), Wright, Smith, Bell, Lawrie, Hector, Williams, Humphris, and Wilson (Hon. Secretary).

Visit to Roseworthy College.—The Chairman referred to the visit to the Roseworthy College. He commented favourably on the work done there. The comparative failure of the crops he attributed, not to the treatment the lands had received, but to the unfavourable season.

Veterinary Science.—Mr. Wilson read a paper calling attention to the lack of knowledge of farmers generally in the treatment of stock diseases. Most of them were in the hands of local "quacks," who probably knew less about the matter than themselves. He recommended farmers to purchase standard works on veterinary science, and endeavour to master them. He was afraid however, that there did not exist sufficiently elementary books concerning diseases prevalent in this State. He suggested that the Government experts should be instructed to supply the deficiency. Perhaps, he added, the Editor might collect and tabulate such reliable information on the subject as is supplied from time to time by the branches. He urged that instruction in veterinary science should be given in connection with the Agricultural College. In brief, considering the great importance of stock to the State, he considered that stockowners generally should be protected against the delusive advice of unqualified "quacks." [We agree with much that Mr. Wilson has had to say on the subject, but not with some of his suggested remedies. The perusal of works on veterinary science would, no doubt, be an advantage to many farmers. It is just possible, however, that in most cases it would supply them with that little knowledge against which Mr. Wilson warned his hearers. The administration of certain simple remedies is, no doubt, within the reach of every stockowner; but in serious cases we have no doubt that is is far wiser to call in the help of a qualified man. Veterinary science is already taught at the Agricultural College, although it is not pretended that holders of the College diploma are qualified veterinarians. We believe, however, that a training at the College should enable most young men to successfully deal with the common ailments that affect stock.—Ed.]

Stansbury, October 4.

Present — Messrs. A. Anderson (chair), P. Anderson, Antonio, Brundell, Faulkner, Henderson, Jones, Sherriff, and Cornish (Hon. Secretary).

Weeds.—Members referred to the prevalence of weeds in the crops this year. Sheep weed was very strong, and the poppy had made its appearance. Mr. Sherriff stated that the latter could be kept in check by fallowing and good cultivation. [This has not been the experience in other parts, well-prepared fallow being often overrun with poppy when cropped. No trouble should be spared to clear out this weed whenever it makes its appearance.—Ed.]

Saltbush.—Mr. P. Anderson tabled samples of saltbush and other fodder plants grown by him, the former being especially vigorous, and promising to be of great value for summer feed. Mr. Faulkner read a paper on general farming, in which he strongly advocated fallowing land for wheat.

Appila-Yarrowie, October 10.

Present—Messrs. Keller (chair), Francis, Bottrall, Lawson, Fox, Stacey, Catford, Becker, and Bauer (Hon. Secretary), and eight visitors.

Congress.—Delegates reported at length on proceedings of Annual Congress, and on visit to Roseworthy College.

Cattle Complaint.—Mr. Bottrall reported that some of his cows were suffering from impaction, and one had died.

Homestead Meeting.—Meeting was held at Mr. Bottrall's homestead. Visitors inspected the crops, buildings, &c., and were afterwards entertained by Mr. Bottrall and family.

Mallala, October 6.

This meeting took the form of a lecture delivered by Professor Towar to the members of the Bureau and about 150 visitors. Mr. Worden was in the chair.

Professor Towar furnished some interesting comments on soil fertility. After referring to the slow formation of arable soil he referred to some of the factors of soil fertility. He pointed out that although the soil is formed of many different constituents, yet the one which had probably the most influence on vegetation was water. Its influence varied according to the climate in which the plants are grown. In cold countries it was frequently necessary to regulate excess by underdrainage, whilst in hot countries methods of cultivation had to be adopted that tended most to conserve a scanty rainfall. He referred also to the importance of substances found in exceedingly small quantities in the soil, such as nitrates, phosphates, and potash. Experiments had already shown the beneficial effect of phosphates in this district. He also referred to certain substances which might have an indirect action on the fertility of the soil, amongst others, to common salt. He commented on the poverty in organic matter of the soils of more or less dry arid countries. A soil rich in organic matter was in a better position to retain moisture. To overcome this difficulty he recommended ploughing in the stubbles and spreading manure in the fields in the fresh state.

Pine Forest, September 23.

Present—Messrs. Payne (chair), Masters, Inkster, and Barr (Hon. Secretary).

Stock Diseases.—In reply to the Chairman the Secretary stated that, contrary to what he had been given to understand, no discussion had taken place at the Congress in reference to diseases of stock prevalent in the north. [We regret that this should have been the case. We had hoped to secure the help of the Chief Inspector of Stock on this subject. If the Branch will refer to us in detail on the matter we shall endeavour to obtain information for them from reliable sources.—Ed.]

Soursops.—Reference was made to the spread of soursops in the Tickera district. Mr. Masters suggested common salt as a remedy, although he had no personal experience in the matter himself.

Congress.—Mr. Barr reported on Annual Congress, and regretted that the Officers' Conference proved a comparative failure.

Bute Field Trial.—Mr. Inkster reported on field trial held at Bute on August 13. He commented on it as being generally successful.

Riverton, October 11.

Present—Messrs. Hussey (Chairman and Hon. Secretary), Gravestock, Kelly, Glynn, Nash, Cooper, Davis, and Hannaford.

Soil Moisture.—Mr. W. Hannaford read a paper on this subject. It was absolutely necessary to do all they could to conserve the moisture in the soil. This work required much careful thought, as each soil requires different treatment. For this district good deep fallowing to allow of aeration of the soil and to let the rain in was, he thought, essential. After ploughing, the land should be worked in such manner to firm the lower portion, and secure a fine surface tilth. The capillary movement of moisture from the subsoil to the upper layers, where the roots are, must be encouraged; but a good tilth secured to prevent the evaporation of moisture from the surface. Many soils were deficient in humus, which should be supplied by growing crops to plough under. The growing of peas and root crops will be found beneficial to the succeeding wheat crop.

Balaklava, October 14.

Present—Messrs. Manley (chair), Anderson, Reid, Thompson, Smith, Robinson, Neville, Thomas, Vivian, Baker, Burden, and Sage (Hon. Secretary).

Cropping Stubble Land.—Mr. Robinson read a paper on this subject. In a district with a scanty rainfall and a short growing period it is folly to continue the practice of stubble cropping. His efforts to grow profitable crops over a period of six years have only resulted in failure once, and that was due to cropping stubble land. There are instances where farmers have had fair returns from land so treated, but they are the exceptions; in nine cases out of ten the result has been failure. The usual saying is "if I get a wet season I will get a bit of hay," but that "if" comes in the way and the wet seasons are few and far between. Farming is a business and should be carried on systematically; that is to say a farmer having 900 acres of land should crop 300 acres, fallow 300 acres, and have 300 acres in grass. If he crops a part of his stubble land he is at once thrown out of his system, and the portion so cropped is at a disadvantage in the succeeding crop. Grazing in conjunction with farming is most profitable if fat stock maintain anything like the prices of late years, and we have every reason to believe they will. It does not take many acres that have previously been liberally manured to fatten a nice little flock of sheep. This year he bought store wethers at 7/ and in three months received 25/ per head for them. Do not on any account crop your stubble land; it will be far more profitable to graze sheep on it. Cropping stubble land also necessitates the removal of the straw by burning or otherwise, which lessens the amount of humus which is so essential to keep up the fertility of a soil. Members farming plain land were unanimous that crops should be grown on fallow land only and the stubbles grazed. Those having scrub land agreed that after the bushes were dead it was best to only crop fallow, but when the land was new it was necessary to crop twice or even three times in succession, so that the grass will get a hold and a fire got through the bushes, as more stumps will be killed out by one fire than by cutting the bushes half a dozen times. Mr. Smith stated that with his light land he found it paid him best to crop once in four years only, and that on fallow; he would rather cut the shoots than crop a second time. Last year he had some manure left over, so told the boys they could fence off a bit of the stubble land and put it in, but it was a failure. The Secretary, in reply to a question, stated that for experiment he had tried fallowing mallee where the bushes were green, ploughing strips through the paddock and filling in the spaces after harvest and sowing both crosswise at the same time; on every strip fallowed there was a much poorer crop than the parts broken up after harvest. He thought the explanation might be that where the land was fallowed the roots had time to get a fresh hold whilst those on the summer ploughed had not. It was not safe to work fallow land deep at seed time on account of takeall.

Hartley, October 17.

Present—Messrs. W. Brooks (chair), J. and T. Jaensch, Hassam, Reimers, Harvey, C. Brooks, Sanders, Wundersitz, and Stein (Hon. Secretary), and four visitors.

Harvesting Crops.—This subject was discussed at length. For hay the stringbinder was generally recommended, as there was less labour attached, and the hay was free from stones, dirt, &c. Sheaved hay was also more convenient to handle in chaffcutting. Mr. W. Brooks found binding and threshing not a success for wheat. In his opinion the best and cheapest way to harvest the grain was with the complete harvester. Three horses would draw a machine taking a 5-ft. swathe. The work was done with less labour, and the bagged wheat was generally cleaner than under ordinary conditions. Harvesting was got through quicker and cheaper with the new machine. A motion indicating the complete harvester as the best machine for harvesting wheat crops was carried.

Inkerman, October 14.

Present—Messrs. Sampson (chair), Kennedy, C. H. Daniel, Smart, Hewett, and C. E. Daniel (Hon. Secretary), and one visitor.

Licensing Stallions.—Mr. Sampson strongly condemned the proposed imposition of a licence-fee on stallions travelling for hire. It would do no good, but would add to the cost of horsebreeding. Other members agreed, and it was unanimously resolved that this Branch strongly opposes any tax being placed on stallions whether serving for hire or otherwise.

Morning and Evening Milk.—Mr. Sampson stated that he had found no difference in the percentage of butter fat in the milk given morning and evening.

Impaction.—The Hon. Secretary wished to know best preventive treatment for impaction. It was for young stock which were paddocked by themselves. [The Stock Department recommends giving them succulent food whenever possible; also a mild purgative occasionally. Place mixture of bonemeal, salt, and sulphate of iron where they can help themselves.—Ed.] Mr. Smart had lost a valuable cow at calving; the calf had turned round and appeared tail first. He tried without success to remove it, and had to destroy the beast. [In such cases the services of a competent veterinary or stockman with experience of similar cases are required to remove the calf.—Ed.]

Colton, October 11.

Present—Messrs. P. P. Kenny (chair), M. S. W. Kenny, Packer, Kleeman, Whitehead, Shepard, Inkster, Riggs, Barnes, and Hull (Hon. Secretary), and two visitors.

Season.—Owing to the prevalence of hot winds during the past month the yield has been considerably reduced, and in but few cases will it exceed 4 bushels per acre. Some of the crops are almost past redemption, the season on the whole having been the driest experienced since the farmers settled here. This meeting was held at the residence of Mr. W. J. Packer for the purpose of inspecting the crops put in with different kinds of manure supplied by the Department of Agriculture. A decided improvement was noticed in the crops receiving manure. Shearing has been completed in this district. The clip will be fairly good, but from one-fourth to one-third less than last year.

Hahndorf, October 18.

Present—Messrs. von Doussa (chair), Spoehr, Sonnemann, Sandow, Bom, Jaensch, Byard, Rundle, Grivell, and Schubert (Hon. Secretary).

Apple Growing.—Mr. Sandow read a paper on this subject:—

In selecting a site for an orchard in the hills, it is wise not to choose too hilly a situation, but rather a gentle slope, with a south-eastern aspect. The richer the surface soil the better for apple and pear growing. A loamy rich soil, with a fairly light clay subsoil, which will allow the roots to penetrate to a considerable depth, is most suitable. To grow a healthy tree, it is essential that the ground should be well drained. Apple trees will neither grow nor bear fruit in soil stagnant with water. The trees should be planted 18 or 20 ft. apart. This distance will allow plenty of room to work the cultivator. The holes for the trees should be taken out 4 ft. square by 18 in. deep, and the soil in the bottom of the hole well moved up with the pick. The holes should be dug three or four months before planting the trees. This will enable the sun to play into the hole, and on the soil that has been taken out, thus removing the sourness. When planting, return the clay to the bottom of the hole, then fill in with surface soil up to six inches above the natural level of the ground; form a mound in the centre of the hole, and set the stake. Now place the tree in position, spreading the roots evenly around; put the strongest roots on the side where the wind is most prevalent, distribute two or three handfuls of bonedust in the soil around the roots; place some good loamy soil over the roots, press it down with both hands. Tie the tree to the stake, and prune it. If there are any hares in the district, protect the tree with a wire-netting guard about 2 ft. high. Now complete the earthing up around the tree, throwing a little earth around the bottom of the guard, to keep it in position. When pruning, if the head is formed, cut back to within three or four buds of stock. Some young trees are more vigorous in growth than others. These should be pruned again about midsummer, when they have attained, say 2 ft. 6 in. of new wood. This method will give twice the number of main branches the first year, but can only be recommended for very vigorous trees. This summer pruning will save nearly all the new wood grown during the first season. It will cause the main stock to stouten considerably the first year, and will avoid wasting the vigour of the tree. The object of pruning young trees is to form a proper head. The shoots may be pruned in proportion to their length, cutting out such as cross one another, and only retaining these main branches required for fruit production. To achieve success in fruitgrowing we shall have to pay more attention to summer pruning and using proper manures to grow the various sorts of fruits. We must not be above taking lessons from men who have given much study to the subject of fruit culture. Some growers appear to be "full learnt," and are either too proud, or, shall I say, too ignorant, to accept the information gathered by men who have the facilities to get the latest experience of fruitgrowers in all parts of world.

Redhill, October 14.

Present—Messrs. Siviour (chair), Lithgow, Steele, Robertson, Nicholls, Wheaton, Wake, Ladyman, Lithgow (Hon. Secretary), and one visitor.

Blacksmith Shop on the Farm.—Mr. Wheaton read a paper on this subject. On large farms he considered it profitable to have a blacksmith shop fitted up, as there was a lot of this class of work always requiring attention. The teaching of farm blacksmithing at the College gave the students much useful knowledge. The cost of a good farm smithy would be about £30, viz.:—Bellows and forge, £6; 1½ cwt. anvil, £3 10/; vice, £1 5/; stocks and dies, £1 10/; sledge hammer and engineer's hammer, 12/; 8 pair tongs, £1; steel for punches, chisels, &c., 10/; assorted sizes of iron, £3; sundries, £1 13/; shed, £10; and £1 will give enough fuel for a lot of work. As experience is gained it will be found profitable to lay out another £20 or more for tools and supplies. Any one taking an interest in the work can do many jobs to machinery, &c., that would otherwise necessitate the employment of a smith. When too wet for outdoor work the time could be well spent making hooks, bolts, &c., and doing small repairs. The farmer could sharpen steel shares himself in less time than it would take going to the blacksmith with them. It was advisable for farmers' sons to learn as much as possible about blacksmithing.

Golden Grove, October 16.

Present—Messrs. McPharlin (chair), Harper, Woodhead, Milne, Rawlins, Robertson, and Coles (Hon. Secretary).

Black Rust.—A short discussion took place on this subject. Mr. McPharlin stated that the disease had made its appearance in the neighbourhood; it was most noticeable in the soft wheats and where the seed was sown thickly. Members knew very little about the origin, &c., of this disease.

Naracoorte, October 11.

Present—Messrs. Schinckel (chair), Wardle, Caldwell, Wynes, and Terry (Hon. Secretary).

Business—Delegates reported on proceedings of Annual Congress. Some discussion took place on the codlin moth question. Mr. Schinckel reported that he had disposed of the bull Royal Progress, and secured another well-bred Jersey to replace him.

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of men registered and found employment by Government Departments and Private Employers from September 29 to October 29, 1902.

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths	67	117	250
Masons and bricklayers	—	—	4
Carpenters	3	—	3
Plumbers and Ironworkers . . .	4	—	—
Boilermakers and assistants .. .	1	—	2
Blacksmiths and strikers	2	—	—
Fitters and turners..	3	—	2
Moulders	2	—	1
Engine Drivers and Firemen	1	—	—
Crane Drivers	—	—	1
Trimmers	1	—	—
Compositors	1	—	—
Apprentices	5	2	4
Cleaners	3	—	—
Porters and junior porters	12	3	3
Totals	105	122	270

October 30, 1902.

A. RICHARDSON, Bureau Clerk.

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DEPARTMENTAL NOTES AND WORK.

During the early part of November the Hon. R. Butler, Minister of Agriculture, paid a visit of inspection to the northern districts where the crops have failed, and on his recommendation the Government has decided to allow payments in connection with the seed wheat loans to stand over for the present. The Minister had also visited Port Lincoln district for the purpose of inspecting lands available for settlement. Full report on this visit will be found elsewhere in the present issue.

South Australian growers of table grapes will be pleased to learn that after considerable correspondence, the Queensland Department of Agriculture has removed the prohibition on the importation of grapes from this State. With a view to preventing the introduction of phylloxera, the importation of grapes into Queensland has been totally prohibited for some years, but the concession alluded to has been granted to South Australia, as it has been shown that phylloxera does not exist in any of our vineyards.

At the Annual Congress in September, a resolution was carried that all experts connected with the Department be requested to annually visit the Branches. It would be impossible to comply literally with such a request, but the Hon. Minister has decided that the various officers shall visit the Branches whenever possible. Requests for visits should be addressed to the Secretary for Agriculture. It should be pointed out that Mr. D. F. Laurie is not an officer of the Department of Agriculture, and at present arrangements cannot be made for any visits by that gentleman.

Attention is directed to the conditions under which free scholarships at the Roseworthy Agricultural College are offered. In the past there has not been as much competition from country districts as was anticipated by the Department. It is difficult to understand why this has been the case, as the scholarships afford a splendid opportunity to farmers' sons who desire to secure a good practical anl scientific agricultural education. We hope that the six scholarships to be offered in March next will be met by a greater number of candidates than has been the case in the past.

Conferences of Branches of the Agricultural Bureau have been arranged as follows:—Northern Yorke's Peninsula at Brinkworth on February 11 and 12;

Northern Branches, at Crystal Brook on February 11. [It will be necessary to alter this date to avoid clashing. —Ed.] River Murray Branches at Mannum, on February 25 and 26. The committees organizing these meetings should bear in mind that short practical papers are needed, and that the discussion on papers are often of equal if not greater value than the paper itself. Too often the Conference is spoilt by attempting to crowd too many papers into the programme.

The Annual Conference of the surrounding Branches was held at Angaston on November 5 and 6 In addition to representatives from various Branches, Professor Perkins, Professor Towar, and Mr. Geo. Quinn attended on behalf of the Department of Agriculture. The visitors were conveyed to various orchards and vineyards, as well as to other places of interest. During the month Professor Towar has paid an extended visit to the Lakes district, visiting Wellington Lodge, and surrounding stations and Meningie.

During the month, Inspector Brown has been fully employed in inspecting imported fruits and plants, and in passing fruits, vegetables, and plants for export to adjoining States, which demand certificates of freedom from certain diseases. In the Mount Lofty Ranges districts Inspector Monks reports between November 4 and 24 having visited 210 orchards Of these, 43 are spraying with arsenites for the destruction of codlin moth. The other precautions such as scraping the tree stems and bandaging which should be well in progress are but tardily observed in many instances. In the Barossa districts Inspector Trimmer began work on November 12, and reports to November 24 having inspected 140 orchards and gardens, 21 of which are spraying for the destruction of codlin moth, and other general precautions are being observed in connection with this pest

During the month 4,163 cases of fruits were imported Of these, 3,888 were two-bushel crates of bananas, 252 similar packages of pineapples, and 18 cases of cucumbers. Of these 15 crates of bananas and five crates of cucumbers were refused admission owing to over ripeness engendering a suspicion of disease. During the same period 27 packages of plants were admitted to the State. Of the 3,398 cases of fruits exported during November to States demanding certificates of freedom from disease, 2,860 were locally grown, and consisted of oranges, lemons, and cherries chiefly. Broken Hill took 3,298 packages of vegetables, and 20 packages of plants were passed for export to interstate destinations.

In the Clare district, Inspector Kelly has been engaged seven days during the month, and has visited 54 orchards and gardens instructing the occupiers how to deal with codlin moth. With one or two exceptions the Inspector reports good care on these properties. Nearly all are spraying for codlin moth, and some most carefully and effectively. In the town of Clare the Inspector has induced a good many small garden owners to have their apple and pear trees carefully sprayed. During the month, Mr. Quinn has been busy in connection with the spraying tests for codlin moth. Those at Clare, Penwortham, Angaston, Houghton, Chain of Ponds, Summertown, and Piccadilly have been visited, and the progress noted. Demonstrations in green pruning have been given at Lyndoch in connection with the local Agricultural Bureau, and at Hindmarsh before the Horticultural Society of that town. Addresses were delivered at the Conference of Agricultural Bureaux at Angaston, and at the meeting of the Lyndoch Branch Bureau on the treatment of peach trees. Owing to the unusual interest at present taken in arsenical spraying for codlin moth much time has been occupied in satisfying enquiries by correspondence or by personal interviews.

On the recommendation of the Inspector of Fruit, the Government have withdrawn the regulations under the Vine, Fruit, and Vegetable Protection Act so far as they concern the notices given by the Inspectors to owners of infested orchards. These regulations have proved unworkable, and in the future the Department will do the work under the Act itself, which gives the Inspector extended powers. Clause 9 of the Act reads:—"If any inspector shall be of opinion that any kind of tree or plant is affected by any insect or disease, he shall report the same to the Commissioner, who may authorise the Inspector to take all such measures for the eradication of the insect or disease, whether by destruction of the tree or plant or otherwise as the case may in the opinion of the Inspector require; and it shall be lawful for every such Inspector to direct any person in occupation of any land on which any disease or insect shall exist to take such measures and do such acts as the Inspector may determine for the eradication or destruction of such insect or disease."

The Produce Export Department is busily engaged in dealing with lambs for export. Up to the present 41,400 carcases of lambs, and 4,300 of mutton have been dealt with. Although the lambs naturally show the effect of the severe season they compare favourably with previous years' shipments. The total of last season's export has already been exceeded this year, and it is anticipated that shipments will continue up to Christmas. The Depot is also sending on 100 prime young turkeys, to test the Christmas market in London. These birds average 14¼ lb. dressed weight. The rabbit season is closed, 9,031 crates containing 228,614 rabbits having been exported through the Depot. No shipments of butter whatever have been made this season.

COUNCIL OF AGRICULTURE.

The monthly meeting of the Council was held on November 26, there being present Mr. R. Caldwell (Chairman), Col. Rowell, Messrs. J. Murray, A. M. Dawkins, T. E. Yelland, B. Basedow, J. Miller, G. R. Laffer, A. D. Bruce, A. Molineux, and F. Krichauff.

The Minister of Agriculture intimated that in compliance with the request of the Council he had instructed the Chief Inspector of Stock to make enquiries from the sub-Inspectors, and to report fully on the disease causing such heavy losses of stock in various parts of South Australia. Mr. Miller, Chairman of the Committee of Agriculture and Stock, reported that the Committee had consulted with Dr. Ramsay Smith and Mr. Desmond on the subject, and Dr. Smith had offered to assist the Council in the matter.

The Secretary read report by Mr. D. F. Laurie on Poultry tick, and suggestion for coping with the pest.

It was decided to recommend that certain improvements be made in the Roseworthy Agricultural College buildings.

Mr. Molineux called attention to statements in the press, which conveyed the impression that the prohibition of the sale of codlin moth infested fruit had been removed, whereas the resolution of the House of Assembly was that the Act should be amended. Until this was done the prohibition could not be removed. Members generally considered that it would be a retrograde step to allow the sale of infested fruit, and it was unanimously resolved:—"That the Council ask the Hon. Minister of Agriculture to enforce the provisions of the Vine, Fruit, and Vegetable Protection Act so far as it concerns the sale of codlin moth infested fruit, until such Act has been repealed."

On the motion of Mr. Laffer it was decided to urge upon the Railways Commissioner the necessity for providing properly ventilated trucks for the carriage of fruit and vegetables, particularly to Broken Hill. Mr. Laffer pointed out that although the trade was regular and profitable and had been so for many years, the Railway Department sent perishable stuff in ordinary trucks, and covered with tarpaulin sheets. The result was that the goods arrived at Broken Hill very much the worse for the journey.

WOOL NOTES.

By G. Jeffrey.

It is through no fault of the Editor that the articles, which I had arranged to write, had not appeared regularly. The truth is, ever since shearing started in the far north, I have been busily engaged in superintending the wool classing done by my students on various stations throughout the State.

As this work is of general importance, it may be advisable to briefly refer to what is being done in connection with the woolclassing alluded to. The more so, as many of the students engaged are farmers or farmers' sons, who leave their homes with the object of getting a thorough insight into the methods adopted in the "get-up" of clips on large-sized stations. To show, the extent of this work I would mention that the students have this season under my supervision, had control of the classing of the following stations, viz.:—Koonamore, Wirrialpa, Mundi Mundi, and Wilpena, in the north and north-east. In the lower north we had charge of Hill River, North Booborowie, Mount Remarkable, Mount Templeton, Mount Cone, and Munduni, and at the present time some of them are engaged on Mount Schanck in the south-east, where they get a splendid insight into the classing of crossbred wool.

That such work has been a success from the sheepowners' standpoint is proved by the unanimous feeling expressed by the various station managers as to the conduct and workmanlike way in which the students performed their duties, as well as by the opinions of the different woolbrokers, and, what is best of all, by the splendid prices obtained at auction for the wools handled by the School of Mines' students.

The lines on which this work is carried on is at once businesslike and educational. Businesslike, inasmuch as the students are paid the ordinary shed-hands' wages, out of which they pay a fee for their tuition; and educational, in that each student, not only sees what is being done, but does practical work, from the picking up of the fleece from the shearing board (including skirting and rolling of the fleece, sorting the pieces, bellies, and locks), until the fleeces are classed out ready to be put in bales.

So convinced am I that this work is good, that I would strongly urge any one interested, who can spare the time, to make the trip next year, full particulars of which can be obtained from Mr. J. A. Haslam, Registrar of the School of Mines and Industries.

This season's wool sales in South Australia are now practically over, and the prices obtained must have been very satisfactory alike to both large and small sheepfarmers. The prophecy I made in my last article, namely, "That merino wool would be 2d. per lb. higher than last year," has proved to have been very near the mark, and the London cables of to-day, announcing a further small rise in merino, and a very substantial rise in crossbreds, is indeed very gratifying. The only danger appears to be that merino wools may go too high, although the bitter lesson learned by buyers three years ago should be too fresh to allow them to lose their heads by creating a boom. The position of crossbreds appears to be sounder than it has been for some considerable time back, and if prices do not go much higher than they are at present there seems little reason to fear anything like a slump in the market.

TRADE WITH SOUTH AFRICA.

The Minister of Agriculture (Hon. R. Butler) has received the following report from Mr. V. M. Newland, Hon. Commissioner for South Australia, dated Johannesburg, October 30:—

"Under separate cover I have the honour to forward you copy of The Transvaal Government Gazette of 8th inst., giving the amended customs tariff of this colony, which is of great importance to your State. I have marked in the ordinance the principal products of South Australia which are affected. Under the old tariff chaff, oat hay, and compressed forage paid a duty of 5/ per 100 lb., plus 7½ per cent., on the value; whilst oats (grain), paid a duty of 10/ per 100 lb.., plus 7½ per cent. on the value. Under the new ordinance all these lines pay only 7½ per cent., placing them in a position to favourably compete with mealies (or maize) as forage. It is true a certain quantity of oats has always been used here, but the expense has been a deterrent, average cost being about 25/ per 100 ℔., against mealies 9/6 per 100 ℔.; whereas many people will prefer oats under the new tariff. Whilst on the subject of forage, I may mention that a large contract for compressed fodder was recently placed by the railway authorities with a South Australian firm.

"Honey, jams, and jellies, which in the past carried a special duty of 40/ per 100 ℔., in addition to 7½ per cent., are now only charged 1½d. per ℔. beyond the 7½ per cent.; whilst the special duty on canned and dried fruits is reduced from 3d. to 1½d.

"The great point of advantage to Australia in the present ordinance is that it offers no preference to the produce of the other South African States. Whilst Australian manufactures retain their present high standard in these lines, those of South Africa have small chance of competition without a preferential tariff. It must be borne in mind that the present tariff is only a provisional and temporary one, and that it is practically a certainty that when a normal condition of affairs once more obtains a revision will take place, and preference be shown the other South African States; but the present moment certainly offers an opportunity to obtain a footing for new lines. More particularly does this apply to wines and spirits. Under the old tariff the consumption of Cape brandy was very great, it having an advantage of 4/ per gallon in duty over imported spirits. Under the new tariff, the extremely low rate of 7½ per cent. on wines formerly imposed is now superseded by a charge of 4/ per gallon, whether the wine be imported or of colonial manufacture. Many people drank Cape wines on account of their cheapness, but now that all wines will be dearer by 8/ per case, it is anticipated that the consumption of better class wines will increase at the expense of the low-grade Cape wines. At all events, Australia has not for the moment to face a preferential tariff. The small consignments of clarets and other light wines sent me from your State have met with the approval of buyers, and if sellers will meet buyers fairly a good business promises to result. In this connection it is well to note that English and Continental firms freely give 60 and 90 days' terms; whilst all quotations supplied me from South Australia have been for cash, or, at the most, draft at 30 days. No house can well afford to face the difference in terms unless commensurate advantages are offered in the way of price and quality. As a matter of fact, a common French claret can be bought at 10/ per dozen f.o.b., on 60 days' draft, and the very fact of it being a French wine makes it more readily saleable at an equivalent figure to a much superior Australian wine. Given ordinary financial facilities, I think good orders would be placed here; but I have found very few people willing to import on a cash basis."

PORT LINCOLN DISTRICT.

During November the Hon. R. Butler (Minister of Agriculture), in company with Messrs. W. J. Shannon, M.P., W. Blacker, M.P., and the Deputy Surveyor-General, paid a visit to the Port Lincoln district, for the purpose of inspecting the Koppio Estate, recently purchased by the Government, and another estate under offer. Mr. Butler has furnished the following report of his visit:—We started from Port Lincoln, one of the most picturesque spots in Australia, and drove to the Koppio survey camp, where we stayed for the night. The contrast between this country and the northern districts I passed through recently was most striking. Away along the coast, with a background of hills covered with grass, and occasionally a little cultivation, you soon reach the old Poonindie Mission Station, containing about 15,000 acres, and any one visiting this fertile strip of country, which is blessed with an abundant rainfall, with crops of wheat just ripening, and averaging at least 12 bushels to the acre, and oats and malting barley that will yield probably double that quantity, must admit that at the rent fixed by the Land Board originally—averaging about 4d. an acre, with the purchase price from 10/ to 22/ per acre—the settlers had every opportunity of successful occupation, and that there is no reason for reductions in rents on this land. Wirenetting is an absolute necessity right through the country, as rabbits are very numerous, and the same will be necessary when Koppio is divided if the settlement is to have any prospect of success. This country is splendidly adapted for orchards and vineyards, and the surprise is that more has not been done in this direction. To show the fruitfulness of the soil I might mention that a paddock of wheat was pointed out to me which will average 20 bushels to the acre. It was dressed with superphosphate, but not fallowed. This land is situated within a mile or two of the southern boundary of Koppio, and the owner told me it was the thirty-second crop The system of fallowing, which is regarded as absolutely essential to successful cultivation on similar soil elsewhere, is rarely resorted to, but I was satisfied that it would prove beneficial there.

The Koppio Estate, situated four miles on each side of the Tod River, contains over 19,000 acres of undulating country, with nice flats. Some of the land is rocky and precipitous, but wattle bark could be a profitable industry on the rougher parts, as the few on the land are of splendid growth. This estate is being divided into about 22 blocks, varying from 400 to 2,000 acres, and will be allotted in a few weeks. I made a close examination of the property, and feel satisfied that it will be successfully settled if a wise selection from among the applicants is made. Men experienced in horticulture, viticulture, and dairying, as well as woolgrowing, are required. The rainfall at the head station during this exceptionally dry season has been over 17 in. The manager informed me the average was considerably over 20. in.

From Koppio we drove northwards through the western side of the Hundred of Stokes. It is splendid scrub lands, with a reliable rainfall. Then we travelled for five or six miles through the mallee country to the north and west, which is now being surveyed for agricultural purposes. Residents who should be able to speak with authority say the rainfall averages over 15 in. and up to 20 in., and that handsome returns will be obtained after the first two or three years, when the expense of clearing and fencing has to be faced, I have no doubt. It has been proved that this land responds splendidly to the use of artificial manures. A great mistake has been made in the past in allotting the land in blocks much too large. The land is absolutely useless for pastoral purposes in its present state. It is covered with scrub, destitute of feed, and overrun with vermin; but after clearing and cultivation it will become valuable for pasture as for agriculture.

It may be well to remind those who contemplate occupying this country that, though the rent is low, considerable expense will have to be incurred in horsefeed and in breaking down the scrub and preparing for the first harvest; but there need be no fear of a total failure from drought, as has been experienced in the north. From Tumby Bay right through the Peninsula west to Warrow there is a very large area of country suitable for wheatgrowing, and it is through this country that a light railway has been suggested; but unless care is taken in placing as many on the land as can profitably occupy it there will not be much chance of sufficient traffic to justify a light line.

On returning to Port Lincoln we drove through an estate of 6,000 acres now under offer to the Government, and on Saturday spent the morning in looking at the country west of Port Lincoln. Certainly it is not very inviting from an agricultural point of view, as it is densely timbered, and the rock is too close to the surface in places, a great deal of the country being covered with the yacca bush, and being absolutely destitute of feed when left in its native state. But in the few instances where the land has been cleared of the bush, costing, I understand, about 6/ an acre, good crops of wheat and barley are growing, and the land where not cultivated is overrun with grass, in marked contrast to the adjoining lands.

I am satisfied, in spite of the vermin difficulty (for rabbits literally swarm over all the country, and cultivation is impossible without netting) and the expense of clearing the land of timber which in many places is covering a third of it, that a bright future is before this part of the State. Some of the finest wheat grown in the State will be grown this year in this part, and in a garden joining Koppio apples are produced of the choicest quality.

Of course, the present means of transit across the gulf will prove altogether insufficient when the country is even half-developed; but as the many varied industries suitable to the district increase, so it will be found that the necessary speedy transit will be forthcoming. The experience of the last few years has taught us that it is useless to attempt to push our agricultural settlements into country with a small and uncertain rainfall, and that even if the initial expenditure is greater it will be better to face the development of land where the rainfall is good, even if the land is more uneven in quality.

ROSEWORTHY AGRICULTURAL COLLEGE NOTES.

FREE SCHOLARSHIPS.

In order to give farmers and others, who could not otherwise afford the expense, an opportunity of sending their boys to the Roseworthy Agricultural College, the Department of Agriculture offers six scholarships, each of the annual value of £30, and tenable for three years. These scholarships are offered for competition each year, and are open to boys of not less than 15 years nor more than 18 years of age on the April 1 of the year in which they compete. Students already in attendance cannot compete.

One scholarship is allotted to each of the following districts:—

District No. 1.—The Corporations of Adelaide, St. Peters, Norwood, Unley, Thebarton, Hindmarsh, Port Adelaide, and Semaphore.

District No. 2.—The County of Adelaide, exclusive of the Corporations included in District No. 1.

District No. 3.—The Counties of Grey, Robe, MacDonnell, Cardwell, Buckingham, Russell, Hindmarsh, Sturt, Carnarvon, Flinders, Jervois, Musgrave, and Robinson.

District No. 4.—The Counties of Daly, Fergusson, and Stanley.

District No. 5.—The Counties of Gawler, Light, Eyre, Albert, Alfred, Burra, Young, Hamley, and Kimberley.

District No. 6.—The Counties of Victoria, Frome, Dalhousie, Herbert, Newcastle, Granville, Lytton, Blachford, Hanson, Derby, Taunton, the Corporation of Port Augusta West, and such parts of the colony as are not otherwise specified.

The effect of offering the scholarships in separate districts, is to afford the sons of bona-fide cultivators of the soil every opportunity of availing themselves of the chance of free tuition at the College. In the past there has not been the competition from the country districts that was anticipated. Possibly this has been due to the fact that the conditions of the offer have not been fully appreciated by farmers.

The parents or guardians of any candidate must have been resident in the colony for at least two years immediately preceding January 1, in the year of competition, and the candidate must compete in that district in which is situated the school he may have last attended. If, however, any candidate has been less than two years at the school last attended the Minister shall decide in what district the candidate is to compete.

The following are the subjects of examination:—

(a) Practical agriculture, viticulture, and horticulture—	
I. Oral examination	300 marks
II. Written examination	150 marks
(b) Elementary chemistry or Elementary physics	100 marks
(c) Elementary mathematics	150 marks
(d) Drawing	100 marks

The next examination of candidates will be held at the Agricultural College on March 19 and 20, 1903, and intending candidates must forward their names to the Principal of the College not later than January 1, 1903. Application forms, syllabus of subjects, and all other particulars may be obtained on application to the Secretary of the Agricultural College.

FARM.

Field No. 7.—About 40 acres were ploughed and sown to summer crops, which have so far done well, but further showers are required to bring them to maturity. The balance of the field was cut with the mower, the shorter and more weedy stuff being used to fill the silos, and the remainder made into loose hay, which is being fed to horses and cattle. All four silos are full. Field No. 4, of 120 acres, has all been cut for hay, and the paddock is expected to return about 160 tons. Field No. 16.—About one-third of this field cut for hay, and the rest for grain, which will be threshed, and the straw baled at once.

Ebsary's.—(A) (Phosphate Experiments)—This has been cut with the binders, and will be hauled to the barns, weighed, and threshed. This field, with No. 16, promises a good lot of seed wheat of King's Early variety. (B and C). (Variety Tests)—Nearly all of these are being stripped, and the yields, though small, are as good as the wretched condition of the growing crop and the dryness of the season have ever promised. Stripping began with the early varieties, and with favourable weather should be completed by the end of November, when it is hoped to have all the hay in the stack.

Live Stock.—The stockman has broken in the last of the four-year-old colts, and there is now a surplus of light horses and aged animals. Sheep and lambs are in fair condition, although it has been necessary to cart water for them. Owing to the high price of wheat all pigs are being sold as weaners; sows sold as breeders bring 15/ and 16/, and young boars £1. Several orders are booked ahead, although at present there are still a number of good ones unsold, which are fit for delivery. Four heifer calves recently dropped are being raised on skimmed milk.

Dairy.—A Babcock milktester has been added to the outfit, and a third-year student will now make weekly tests of every cow in the College herd. These tests, together with the recorded weight of the milk from each cow at each milking, will furnish the best means of determining the actual performance of the cows, and distinguish between the profitable and the unprofitable.

Wool.—On November 14, under the guidance of Mr. Jeffrey (teacher of woolclassing), the third-year students inspected the wool as displayed in the various warehouses for the fourth sale of the season. With their usual courtesy, Messrs. Elder, Smith, & Co. entertained the students at lunch, while all the agents cheerfully granted the freedom of their warehouses, and offered other means of adding to the profit and enjoyment of the visit.

EXPERIMENTAL VINEYARD

BY H. E. LAFFER, SUPERINTENDENT OF VINEYARD.

During November the work on the vineyard has been light. Disbudding, especially on young vines just put on the trellis, has taken up considerable time. All young vines have made such strong growth that disbudding was necessary at least twice.

Though the rainfall has been so light, yet the vines have never looked better, nor made better growth than during the present season. Many of the vines were considerably beaten about by the strong winds experienced a few weeks ago, but these have all been tied up now, guarding them from any rough weather we may get later on in the season. All the soil has been lightly cultivated when necessary to keep a fine open surface.

Further experiments in fumigation for peach aphis were carried out under improved circumstances, and were very successful. The tent was dressed with a thin paint made of boiled linseed oil and vegetable black. To completely cover the tent, which is 8 ft. square, and 8 ft. high, took about two gallons of oil, and about a pound and a half of vegetable black. After hanging under a verandah for about a week, the paint was quite dry, and the tent perfectly gas tight. The paint is comparatively inexpensive, and is readily applied by spreading the tent on a floor and applying the mixture with a piece of old cloth as a mop. Work on the trees was commenced on a cool clear morning.

The trees not being very large, there was no difficulty in placing and removing the tent. Practically no harm was done in the way of breaking shoots and foliage. The charge used for each tree was:—

1 oz. pot. cyanide, 98 per cent.
1 oz. commercial sulphuric acid
2 oz. water.

The time allowed for each tree was twenty minutes, and after that time, on the removal of the tent, no trace of life could be observed among the aphides. Even on the ground every one of the insects appeared to be dead. Some of the trees which were treated towards midday, as the sun was becoming stronger, were considerably scorched by the gas. Those which were done early in the morning showed very little ill effects, and some done after the sun had set were not scorched in the slightest degree. It would appear, then, that the treatment should be given on cool cloudy days in preference to bright ones. Best of all would be a bright moonlight night, when there would be quite sufficient light to carry on the work. Owing to the want of a tent these experiments were rather late, the foliage having already suffered considerably from the ravages of the pest. Next year we hope to take the matter up in good time, and obtain conclusive results of the work. There can be little doubt as to the superiority of fumigation over spraying for such diseases as the peach aphis. We are indebted to Mr. A. Quick, of Marion, for the use of one of his tents to carry out the experiments.

FARM HINTS FOR DECEMBER.

By A. Molineux

Since the history of the world began there has been only one prophet whose long weather predictions have been justified by after events. That man was named Joseph, who told King Pharoah to provide during seven years of good seasons against seven years of drought. Pharaoh, wiser than the majority of farmers who have succeeded him up till this present day, acted upon the advice given, and saved up sufficient of grain and fodder to supply not only the requirements of his own farm and home, but also had some to spare for his starving neighbours. We can make bricks, nowadays, without straw, but we cannot feed live stock without fodder; and, although straw may not be as nutritious as the best hay, still it will keep cattle in fair condition if they have enough of it. Whilst a farmer has an abundance of good, clean straw, he is justified in keeping more live stock than he could hope to do when he has to trust to the natural herbage. In some seasons, and not seldom either, the value of the straw that was left on the field or burned would have amply repaid the whole cost of harvesting and marketing the crop. There are a hundred advantages resulting from the employment of the string-binder and thrashing machine, but I will leave the intelligent farmer to enumerate them for himself—the other man does not want to know anything about it.

In every crop, of whatsoever kind it may be, there are always some plants that are superior in all respects to the general average; and in all cultivated crops there is a general tendency to return to the "wild" origin. If the best plants were selected out of each crop for seed-bearing, and were cultivated in separate plots for increase, the result would be something much better than the average of the unselected seed. But, if selections were made from the selected seed, then the result would soon be something of highly superior quality. Every farmer should maintain his own seed plots, keep his seed clean and pure, and select and reselect until he has produced a variety which will be more hardy, prolific, pure, and generally better than the average; and, owing to the tendency to deterioration, he must continue to maintain the standard by selecting his seed.

Where any facilities for irrigation exist, even on a small scale, it will be easy to raise crops of maize, millets, sorghums, &c., to serve as green feed for cows, poultry, and other animals; but the seeds must be sown in drills about 30 in. apart to allow of the frequent use of hand or horse hoes. There is a possibility that similar feed might be raised on good, loamy, friable soils without irrigation if the seeds are soaked for 24 hours before sowing, especially if a good shower has just previously soaked the land. But it is of no use to sow broadcast, nor on stiff, caked, dry soil. These crops must be frequently cultivated during growth.

Where the crops have been mown for hay or reaped with the binder it is possible to at once run the harrows or scarifiers over at least a few acres. Some rape and white mustard seed could be sown previously broadcast—about 2 lb. of each per acre—and the autumn rains will cause weeds and the other seeds to start growing, so that the farm animals will get some early green feed, the fields can be cleaned by the early ploughing under of the rubbish, and the soil benefited thereby. When the surface of a field is loosened up, every drop of rain soaks into the ground; but, when the surface is caked down, much of the water runs away into the nearest waterway. The loosening of the surface prevents evaporation and promotes absorption of moisture.

There is a great wealth of grass in some parts of the State, and a deplorable scarcity in other parts. It has been stated that it is not possible to feed this bare for a chain or two along railway lines, roadsides, and boundaries, as the sheep and cattle will not feed when herded. But there is imminent danger of grass fires, which may devastate immense areas, and the damage may easily amount to a very considerable sum. Is there no way to make firebreaks? Could the herbage be mowed and raked on strips a few chains in width. It is well to be prepared with every appliance for fighting a grass fire, but it seems to me that there would be more safety in trying to prevent the possibility of fires extending to any distance from the site of their occurrence. If no kind of summer green crop can be grown on the headlands of wheat and hay fields, especially along railway lines, then at least a chain wide should be cut early for hay, which should be carried off before sparks from the engines or from other agencies can set fire to the dry material.

I have seen very large pumpkins raised from seed sown in February, so that it is not too late to sow seeds now. The vegetable is valuable for feeding cows and pigs, as well as for use in the house. Pie melons may also be sown. Put at least 10 seeds in each place, at 20 ft. apart. Mix in a good lot of old cowyard manure at each place. Soak the seeds 24 hours before sowing, and if possible give three or four buckets of water to the soil at each spot a day before sowing. Cover the seeds an inch deep and press the soil on them gently. When the plants come up remove the weakest, leaving six; and, when these are in the sixth leaf, remove all but the three strongest. They may be transplanted if great care is taken not to break the tap root. Any shifting of the branches or runners will be injurious, therefore it is usual to sow some maize here and there to prevent the wind blowing the vines over. Some people stick in a number of stakes with the same object in view, but maize is best.

There are plenty of places where potatoes can be grown. The soil should be well enriched with fine old manure, and deeply and thoroughly worked. The seed may be planted in each third plough furrow at a foot apart and 6 in. deep. There is no use in hilling up, but plenty benefit from keeping the surface well cultivated. Of course, if irrigation can be practised a good crop can be assured.

The Agricultural Bureau distributed seeds of many useful fodder plants years ago, and amongst the best of them was the French Honeysuckle (Hedysarum coronarium), known as Sulla, Malta clover, and by other popular names. This did very well on sandy soils, but very few saved seeds, and the plant did not receive the attention that its great merits justified. It appears that the seeds are far more likely to germinate when scalded, and, as the plant is a perennial, it would be well worth while to sow largely on those shifting sand hummocks and dunes which are causing so much trouble and anxiety in parts of our north.

The broadleaf mustard, and various kinds of beets, too, ought to get a great deal of attention. There are thousands of acres where they can be profitably grown for feeding stock, and fair trials should be given to these and other promising fodder plants.

So much has already been written about a number of items deserving the attention of farmers that it is unnecessary to repeat details on the present occasion. Farmers cannot profitably neglect to thatch their stacks; ensilage is profitable, although it involves hard work; it pays well to erect shelters for live and dead stock of the farm; no farm is truly comfortable, or fit to live upon, unless there is a vegetable and fruit garden; the cows, pigs, and poultry often bring more money on to the farm than all the crops that are grown; the butcher, greengrocer, the baker, the hawker, and even the smith and machinist often take a lot of money off the farm for articles and work that could easily be produced or done upon the farm, and many a farmer is unable to purchase articles that he really wants, because that money has already been spent on items that he could have made or produced at odd times. Well, here's reformation and a Happy and Prosperous New Year to us all! ! !

COMPLETE HARVESTER TRIAL.

On Friday, November 28, a public trial of complete harvesters under the auspices of the Royal Agricultural Society was held on Mr. W. Smith's farm near the Smithfield railway station. The arrangements generally this year gave great satisfaction. The paddock selected for the trial carried a crop of Marshall's No. 3 wheat, considered to be worth 18 bushels per acre, and very even in character. Messrs. J. W. Shannon, M.P., W. Copley, and J. McLachlan were judges, with Mr. J. G. Nash as mechanical adjudicator.

The following figures give the decisions of the judges individually:—

Mr. Copley.—Massey-Harris, No. 1, 476; Climax, No. 2, 467; Union, 466; Climax, No. 1, 458; Sunshine, No. 2, 425; Martin, No. 2, 418; Sunshine, No. 1, 415; Massey-Harris, No. 2, 408; Martin, No. 1, 395; Martin, No. 3, 356.

Mr. Shannon.—Climax, No. 2, 469; Massey-Harris, No. 1, 467; The Union, 457; Climax, No. 1, 445; Sunshine, No. 2, 423; Sunshine, No. 1, 419; Massey-Harris, No. 2, 413; Martin, No. 2, 411; Martin, No. 1, 360; Martin, No. 3, 299.

Mr. McLachlan.—The Union, 475; Massey-Harris, No. 1, 471; The Climax, No. 2, 467; Climax, No. 1, 453; Sunshin.e No. 1, 445; Massey-Harris, No. 2, 436; Martin, No. 2, 432; Sunshine, No. 2, 432; Martin, No. 1, 407; Martin, No. 3, 394.

The average of the judges' figures with the figures of the mechanical adjudicator were taken in making the awards which were announced by the Secretary as follows:—

Scale of points.	Total points obtainable.	Massey Harris No. 1.	Climax No 2.	The Union.	Climax No. 1	Sunshine No. 2	Sunshine No. 1	Martin No. 2.	Massey Harris No. 2.	Martin No 1.	Martin No. 3.
1. Clean reaping	75	65	75	68⅓	71⅔	60	69⅓	60	56⅔	71	68⅓
2. Clean threshing	75	73⅔	74	73	73⅓	73⅓	72⅔	70⅔	65	71⅔	65
3. Clean winnowing	75	74	75	75	70	75	71⅔	68⅓	65	71⅔	53⅓
4. Machine making the best marketable sample	50	50	48⅔	50	48⅔	50	48⅔	45	45	46⅔	41⅔
5. Machine with least grain in chaff ...	50	49⅓	48	48⅓	46	49	40	38⅓	40	26	25
6. Machine wasting least chaff	25	23⅔	21	23⅔	21⅓	12⅓	13⅓	22	21	—	—
7. The simplest and quickest disposal of clean wheat	25	22⅓	24	24	21⅓	24	22⅓	21⅔	22⅓	22⅓	22⅓
8. The simplest and quickest disposal of chaff	25	23⅓	23	23⅔	22⅔	10	14⅓	22⅓	23	—	—
9. Ease of draught	25	25	19	18	18	15	16	14	19	15	19
10. Machine least liable to get out of order	25	25	22	20	23	19	22	23	25	23	22
11. Time occupied in reaping	25	22	20	23	18	25	22	20	19	21	18
12. Price of machine	25	18	18	19	18	14	14	20	18	20	20
Total points	500	471⅓	467⅔	466	452	426⅔	426⅓	420⅓	419	387⅓	349⅔
Price		£80	£80	£78	£80	£90	£90	£75	£80	£75	£75
Actual draught (in cwts. and qrs.) ...		4 1	5 0½	5 0	5 0	6 2	6 0	6 0½	5 2	6 2	5 2
Actual time		2.36	2.50	2.33	3.10	2.11	2.33⅓	2.50	3.0	2.4	3.9

CURRANT AND RAISIN GROWING.

By Arthur J. Perkins, Secretary for Agriculture.

In a paper read before Congress in September last, I referred incidentally to currant and raisin growing. At the time my statistical data were incomplete, and I was, in consequence, only able to make brief and vague reference to this important question. To-day, through the courtesy of our Statistical Department, I am in possession of all the information I required, and I can proceed to a careful examination of the interests of this State in this special question.

Position of the Markets.

I may confess right away my firm conviction that both the State and the individual will benefit considerably by the further extension of our dried grapes' area. At the same time, I am bound to recognise that the slow progress of this industry in the past must engender a certain amount of circumspection in the minds of thinking men. I am desirous, above all, to avoid the one-sidedness of the enthusiast, and to examine the question in its every aspect. I make, therefore, no apology for discussing at the outset the position of the markets. Fortunately, the question of foreign markets need not occupy us much at present; they concern the dim and distant future, when local demands will have been overtaken. In the meanwhile let us endeavour to ascertain the requirements of the home markets.

The figures below represent average yearly totals for a period of five years, extending from 1897 to 1901, inclusively.

Average Yearly Imports of Currants and Raisins (1897-1901).

States.	Currants		Raisins	
	Tons	Valued at	Tons	Valued at
Victoria	1472·01	£29,587	489·24	£17,585
Queensland	652·07	16,518	381·33	14,427
South Australia	574·42	11,699	247·78	9,085
Western Australia	266·13	5,595	149 46	5,289
Totals	2964·63	£63,399	1267·81	£46,386

The New South Wales Statistical Department do not distinguish between currants and raisins, both articles being grouped together. For the same period of five years (1897-1901), the average aggregate imports of New South Wales are represented by the following figures:—2,966.40 tons of currants and raisins valued at £93,534. In Tasmania we have the further difficulty of separating currants and raisins from dried fruit generally, with which they are entered in block. In 1900 about 378 tons of dried fruit were imported, valued at £11,762; of these I believe fully 300 tons may be taken to represent currants and raisins, at an approximate value of about £9,336.

The total average imports of the Commonwealth during this period may therefore be summarized as follows:—New South Wales.—Raisins and currants. 2,966.40 tons, £93,534. Tasmania.—Raisins and currants, 300.16 tons; £9,336. Rest of Commonwealth.—Currants, 2,964.63, £63,399; raisins, 1,267.81, £46,386. Totals. 7,499.00 tons. £212,655.

From these 7,499 tons of raisins and currants, valued at £212,655, must be deducted the amount and value of interstate transfers, which average, I am given to understand, about 10 per cent. of the total recorded imports.

Briefly, therefore, the true Commonwealth imports of currants and raisins have averaged yearly, during the period under consideration, 6,749 tons, representing nearly £200,000 paid in tribute to the foreigner.

And if we glance across the ocean we find our near neighbour, New Zealand, importing annually an average of 1,301 tons of currants, valued at £30,782, and 943 tons of raisins, valued at £34,673 (1897-1901). Unquestionably, therefore, there will be elbow room for the dried grapes industries for many years to come within our own territories.

STATISTICS OF PRODUCTION

For the production of currants and raisins there are as yet only two of the States in the field, namely, Victoria and South Australia, and to what insufficient degree our enormous imports bear eloquent testimony. Below are appended the figures affecting the five seasons under review:—

PRODUCTION OF CURRANTS AND RAISINS IN THE COMMONWEALTH.

Years	South Australia.		Victoria	
	Currants	Raisins	Currants	Raisins
	Tons	Tons	Tons	Tons
1897		354·85	38·18	563·80
1898	43·35	208·40	23·10	661·70
1899	56·65	309·50	51·65	898·95
1900	152·35	269 90	165·75	892 35
1901	130·35	407·55	185·75	1468·50

When compared with Commonwealth imports the figures for production are insignificant enough. Nevertheless, the steadily ascending scale in which they present themselves to us since 1897 is a sure indication of healthy progress. It must be recognised that, starting almost level, Victoria has fairly outstripped us during the last five years, particularly in the production of raisins. This is not as it should be. If Victoria can vigorously and, presumably profitably, expand her currant and raisin area in the very teeth of the phylloxera, what is it that we should not be able to do; we, who are as yet free from this devastating pest?

PRESENT EXPORTS.

It seems almost incongruous that, independently of the interstate transfers of imported articles that have already been accounted for, that the Commonwealth should be able to boast of exports of currants and raisins. And yet such is the case, as the table below will show:—

EXPORTS OF CURRANTS AND RAISINS (PRODUCE OF STATES).

Year.	South Australia				Victoria.			
	Currants.		Raisins.		Currants.		Raisins	
	Tons	£	Tons.	£	Tons	£	Tons	£
1897 ..	0·69	28	119·51	4,192	—	—	28·97	1,147
1898 ..	0·90	22	29·33	1,033	—	—	219·47	7,388
1899 ..	0·01	1	53·20	1,682	1·34	25	234·55	7,524
1900 ..	0·20	10	21·56	847	0·01	1	296·06	10,150
1901 ..	7 00	202	142·22	4,918	2·00	140	368·66	15,095

In the matter of exports, as in that of production, Victoria is again ahead of us. In the year 1901, we have the curious phenomenon of a State importing as many raisins as she exports. It seems quite evident that the bulk of the exported Victorian and South Australian dried grapes pass into some of the non-producing States, and I have therefore thought it of interest to ascertain their destination for the year 1901. The results are shown in the next table:—

DESTINATION OF RAISINS AND CURRANTS EXPORTED IN 1901.

Exported to	Victoria.		South Australia.	
	Currants.	Raisins	Currants	Raisins.
New South Wales	2·00	120·31	5 61	75·85
Queensland	—	102·60	0·11	37·37
South Australia	—	0·99	—	—
Victoria	—	—	0·68	6 71
Western Australia		1·65	0·36	21·98
Tasmania	—	37·33	—	—
Northern Territory	—	—	0 25	0 25
To Commonwealth	2·00	262·88	7·01	142 16
New Zealand	—	104·06	—	—
Fiji	—	0·08	—	—
India	—	0·18	—	—
Ceylon	—	0·20	—	—
Straits Settlement	—	0·03	—	—
Guam	—	0·28	—	—
Java	—	0·05	—	0·05
To Foreign Countries	—	104·88	—	0 05
Total Exports	2·00	367·76	7·01	142·21

The above table shows plainly that what of South Australian and Victorian currants and raisins were exported went mainly to the neighbouring States. It is, however, satisfactory to note that Victoria was able to dispose of as much as 104 tons of raisins on the New Zealand market, in open competition with foreign countries. Her Mildura dried fruit has justly acquired a high reputation, and South Australian growers cannot do better than aim at emulating the excellent example that has been set them. It should be well borne in mind that neither in Victoria nor in South Australia do these exports in any way indicate that local production has exceeded local consumption. For in this same year, 1901, Victoria imported about 416 tons of raisins and 1,317 tons of currants; and South Australia about 107 tons of raisins and 279 tons of currants. (To be continued.)

HOW TO DEAL WITH THE LOCUST.

The Revue Tunisienne of October, 1902, publishes an article by M. Ducloux, on what is described as both an effective and economical method of dealing with locusts. In the belief that the suggested remedy may perhaps prove of value in those districts periodically visited by these insects, we append a free translation of the article.

After referring to the time and money that have in the past been wasted in attempts at subduing the pest, M. Ducloux describes some experiments conducted by him with various fungus parasites imported from New York. Like others before him, he found that the success of such experiments depended largely on conditions of temperature and moisture that do not obtain in ordinary practice. He found it necessary, therefore, to abandon bacteriological methods for special insecticides. It appeared to him important to discover a mixture which, whilst being wholly effective, would not injure vegetation, nor stock feeding on it at some subsequent period.

M. Ducloux believes that he has found a solution to the problem, in the use of a mixture, possessed of the properties of the well-known resin wash, viz. of closing the breathing pores of the insects. He adds, that after numerous experiments he secured excellent results with a mixture of two substances, mutually completing one another in their action as insecticides, viz., cade oil (Oleum cadinum) and lysol, applied in the following proportions:—

Cade oil	1 gallon	Lysol	5 gallons
Water	100 gallons	Water	100 gallons

These two solutions should be thoroughly mixed, and in order to obtain a homogeneous mixture the addition of some alkaline substance is necessary. For this purpose M. Ducloux recommends pure caustic potash. He says nothing, however, as to the proportions in which it should be used. It would seem that but small quantities are necessary to bring about the emulsifying of the constituents of the mixture.

*Cade oil (Oleum cadinum) is a substance extracted from a juniper indigenous of the shores of the Mediterranean—Juniperus oxycedrus. It is said to be frequently used in medical treatment as an antiseptic. Lysol is a compound of complex nature, consisting largely of alkaline, fatty, and resinous bodies According to Ducloux one minute's contact with this mixture is sufficient to bring about the asphyxiation of locusts. The mixture is sprayed on to the hoppers or the flying locusts wherever they congregate, and, according to the editor of The Revue Tunisienne, it has been definitely proved by experiments conducted during the past season in various parts of Tunis to be both a safe and cheap method for dealing with invasions of locusts. Perhaps should occasion arise South Australian sufferers may find advantage in testing this apparently simple method.

FOUL BROOD IN BEES.

In 1885 Messrs. Watson-Cheyne & Cheshire, following in the footsteps of Pasteur, recognised in hives affected with foul brood the presence of a parasitic bacterium, which they denominated bacillus alvei. Since their time this microbe has been looked upon as distinctly specific, and as solely responsible for foul brood. Apparently their inferences and conclusions have not at all times proved satisfactory on the Continent, and in 1900 Belgian bee societies approached the Liege University with a request that new studies be made of the disease. This work was entrusted to Dr. Lamboth, whose researches are published in the September number of The Annales de l'Institut Pasteur.

He believes to have proved that the bacillus alvei, which had hitherto been looked upon as distinctly specific and exclusively connected with foul brood, is none other than a common and well-known microbe, the bacilus mesentericus vulgaris. All bacteriological tests appear to endorse the identity of the two microbes; and, finally, Dr. Lambotte asserts having artificially created foul brood in a healthy hive by infection with cultures of bacillus mesentericus vulgaris. Assuming that all necessary precautions had been taken, Dr. Lambotte may be said to have definitely proved his case.

The practical results of such a discovery are not without significance. Under ordinary circumstances bacillus mesentericus vulgaris is a comparatively harmless bacterium, found both in the cells and within the bodies of healthy bees and larvae. Like similar bacteria, always present within the body of a healthy man, under certain conditions that are, perhaps, not yet well known, these bacteria develop virulent pathological properties, and are then responsible for foul brood. Analogy will, of course, lead us to infer that in this state a diseased hive is a source of danger to its neighbours, and that the germs of a malignant form of a bacillus mesentericus vulgaris are more likely to create new centres of disease than the ubiquitous and harmless form. Nevertheless, it is necessary to remember that, should Dr. Lambotte's views prove correct, an outbreak of foul brood in a clean district does not necessarily imply infection from outside sources. The germs of the disease are practically always present in a more or less harmless form. Should, however, ordinary hygiene be neglected, or should the bees not find food sufficient to rear a healthy brood of larvae, either cause may apparently afford an opportunity for an outbreak of disease in malignant form. It need not be assumed on this account that diseased hives may therefore be neglected—they must at all times be looked upon as likely centres of infection. It should be noted, too, that spores of bacillus mesentericus vulgaris are extremely resistant to the action of ordinary disinfectants, and that nothing less than fire can be depended upon to clear out all traces of malignant forms.

Dr. Lambotte's final conclusions are that healthy well-nourished bees, in clean surroundings, are best able to resist and stamp out an outbreak of foul brood.

COST OF FARMING ON THE WEST COAST.

By D. P. Thomas, Scales Bay.

In previous issues of the Journal we have had papers from members of Arthurton, Mallala, and Brinkworth Branches dealing with the question of "Does Farming Pay?" In each case the writers show that with an average of 10 bushels to 12 bushels per acre they fail to make farming pay. Now the average of the West Coast during the whole of its existence as an agricultural district does not exceed 6 bushels per acre, and yet most of the farmers round here are free from debt. How is this? Either farming in the districts first mentioned must be far more expensive than it is here, or the 12 bushel average pays handsomely.

The following is, in my opinion, a very fair financial statement of the cost of farming in these parts.

To crop 500 acres each year the farmer needs 3,000 acres altogether, as much of the land cannot be cultivated, though it will carry stock.

Dr.

Cost of Land.

Rent—3,000 acres at 1d.	£12 10 0	
Wild dog rates—4¾ miles at 8/	1 18 0	
District Council rates—£30 at 10d. in £	1 5 0	
Land tax—½d. in £—(value £1,125)	2 7 0	
Wire Netting charges under Vermin Proof Fencing Act—10 miles	11 13 0	
		£29 13 0

Improvements.

Five roomed house at £20 per room	£100 0 0	
20-miles fencing at £10 per mile	200 0 0	
Sheds, yards, &c.	100 0 0	
	400 0 0	
Interest at 5 per cent., and depreciation 5 per cent.		40 0 0

Stock at Present Values

12 horses at £15	£180 0 0	
Five cattle at £6	30 0 0	
300 sheep at 7/	105 0 0	
Ten pigs at £1 10/	15 0 0	
30 fowls at 1/6	2 5 0	
	332 5 0	
Interest at 5 per cent., and depreciation at 10 per cent. on £332 5/		49 16 9

Implements.

Six-furrow stump-jump plough	£35 0 0	
Set six S.J. harrows	10 0 0	
Seed and fertiliser drill	42 0 0	
Cultivator or disc harrow	23 10 0	
Mowing machine	19 0 0	
Horserake	9 0 0	
Two strippers	100 0 0	
Winnower	30 0 0	
Wagon	50 0 0	
Tip dray	15 0 0	
Light spring dray	10 0 0	
Sundry implements	20 0 0	
Interest at 5 per cent. and depreciation 10 per cent. on	363 10 0	54 10 6

OTHER EXPENSES.

	£	s.	d.	
Seed for 500 acres – ¾ bushel per acre at 2/6 ..	46	17	6	
Manure, 12½ tons at £5 (landed cost here)	62	10	0	
56 lb. bluestone at 3½d.		16	4	
Repair to machinery and harness	15	0	0	
Interest on value of harness and tools	3	0	0	
Oil, ploughshares, and sundries	10	0	0	
1,000 cornsacks at 5/3 per doz.	21	17	6	
Five woolpacks at 1/11	0	9	7	
Service of stallion	5	0	0	
				165 10 1
Total cost, exclusive of labour				£339 11 2

Cr.

	£	s.	d.
By 4,000 bushels of wheat at 2/6	£500	0	0
By 5 bales wool at £7	35	0	0
By 50 lambs at 2/6	6	5	0
By 3 calves at £1	3	0	0
By 2 foals at £5	10	0	0
By 10 pigs at £1 10	15	0	0
Butter, sheepskins, and sundries .	10	0	0
Total revenue	£579	5	0
Outlay	339	11	2
Balance	£239	13	10

In "cost of land" the figures are based on the actual averages for this district. The improvements are all I consider necessary, and if properly erected, as they should be for the money, ought to last good for 20 years. The stock enumerated is all that the farm will carry without overstocking in times of drought. Ten per cent. depreciation is enough to cover all risks. I have allowed town price with freight added for all implements. Sundry implements include weighing machine, sack trucks, &c. Ten per cent, for depreciation is more than enough for wagons, drays, &c.; in fact most of the implements will last with care for 20 years.

Some of my critics may notice that I allow for an eight bushel crop, besides horsefeed, which no farmer should require to purchase. In the early part of this article I stated that our average was not more than six bushels. My reason for putting the crop at eight bushels is that commercial fertilisers were used here for the first time last year, and crops of rust resisting wheats so treated yielded up to 16 bushels. The present year, which is almost the driest on record, many of the manured crops promise to go over eight bushels. Looking at the other items I cannot see that I have over-estimated any point of revenue.

Now comes the labour question. Most farmers have families who assist them in the work, so that extra labour is only required at harvest time. I think it has been an established fact for some years that farming in South Australia at "contract prices" will not pay. Farmers as a rule are the most frugal and industrious class in the State, at least such is my experience. I have been on farms in the north, and here for 20 years, and during part of the time have been supplying stores to farmers, so that I have seen both sides of the subject. The fact that so many farmers possess property to the value of £1,000, and are free from debt is the best of proof that farming pays, though not at the rate some people imagine. A farmer has his own home and a place where every one of his children who are not going to school can earn its own living, thereby keeping the family together. The farmer is his own master, and has the satisfaction of knowing that the harder he labours the more he earns. I do not know of a life more free than the farmer's, especially when the work is all done in the proper season.

Although many farmers spend a lot of money in giving their sons a good ordinary education, how many send them to the Roseworthy College to make good farmers of them? Farmers who can afford it, and many can, should give their sons one or two years at the College, when they are old enough to know the value of their opportunities. It would be of immense value to our young farmers, and to the State also, if farmers whould give more support to the College.

If wheatgrowing or farming does not pay, how is it that the writers of the papers in the Journal are still farming? How is it that farmers manage to accumulate stock and implements if their work is not profitable? How many artisans can accumulate £500 or more in say 10 years? We have plenty of farmers with stock and implements worth that amount, and yet some will say farming does not pay! Why should farmers discredit their following? Agriculture is a science that needs better knowledge than many other callings, and is worthy of more respect than is usually given to it. Be farmers—and learn to appreciate and admire your avocation. Keep up-to-date implements, good stock, and modern ideas; leave the old rut of conservatism; do not spend the value of your crop before it is reaped, and satisfactory results will follow.

EGG-LAYING COMPETITION AT HAWKESBURY.

At the request of The Sydney Daily Telegraph a very interesting egg-laying competition has been carried out during the past winter at the Hawkesbury Agricultural College. The test originated in a controversy as to the relative merits of the Silver Wyandotte and Buff Orpington as winter layers. To make the contest more instructing The Daily Telegraph offered £21 in prize money, throwing it open to all poultry breeders. The conditions of the test were that each pen should consist of six fowls, all bred by the competitor, that the birds should be penned during March at the college, the test to extend from April 1 to September 30, the birds to be treated alike, and all eggs under 1½ oz. in weight or otherwise unmarketable be rejected.

Forty-one pens of birds were entered, and each pen received daily the following amount of food:—A pint of bran and pollard mash in the morning mixed with liver soup, green feed at midday, and a pint of grain in the evening. Besides, each pen got meat and shell grit. The total cost of food was £34 16/6, the cost per pen being 16/6 for the six months, or 2/9 for each fowl The following is the result so far as the breeds are concerned, leaving out the breeds of which there were less than three pens:—

24 Silver Wyandottes averaged 71.00 eggs.
48 Black Orpingtons averaged 70.04 eggs.
30 Buff Orpingtons averaged 65.14 eggs.
18 Buff Wyandottes averaged 63.61 eggs.
30 White Leghorns averaged 58.50 eggs.
18 White Wyandottes averaged 47.11 eggs.
18 Black Minorcas averaged 32.72 eggs.

Prizes were offered for the pen laying the greatest number of eggs, and for the pen laying the greatest aggregate weight of eggs. The following are the prizewinners:—

GREATEST NUMBER OF EGGS.

1st prize, M. Ward's Black Orpingtons, which laid 548 eggs, weighing 26 oz. per dozen; total value, 71/.

2nd prize, A. Henry's Silver Wyandottes, 519 eggs, weighing 23½ oz. per dozen; total value, 68/9.

3rd prize, Grantham Poultry Farm, Rosecomb White Leghorns, 470 eggs, weighing 24 oz. per dozen; total value, 61/1.

4th prize, G. Kennedy's White Leghorns, 469 eggs, weighing 24½ oz. per dozen; value, 58/.

5th prize, Bosanquet Brothers' Buff Orpingtons, 451 eggs, weighing 24 oz. per dozen; total value, 58/3.

6th prize, W. H. Tombs's Anconas, 444 eggs, weighing 26 oz. per dozen; value, 57/4.

Aggregate Weight of Eggs.

1st prize, Mr. Ward's Black Orpingtons.

2nd prize, Mr. Henry's Silver Wyandottes.

3rd prize, Mr. Tombs's Anconas.

It will be seen that the Anconas, though only sixth both in number and value of eggs, were third in the aggregate weight test. Taken right through there is not much difference between the positions occupied by the various pens in respect to the total number of eggs laid, and the value of the eggs. The value has been calculated on the basis of the eggs laid each week, and the prices for best new-laid eggs at the Sydney auction sales on each Friday.

In considering the result of this test, there are several points worthy of notice. The first is that it affords further demonstration of the fact that productivity is almost as much a question of "strains" as of breeds. For instance, the first prize pen were Black Orpingtons, with an average of 91.3 eggs each, yet the next pen of the same breed was eighth on the list, and only averaged 73 eggs per pen. Again, the best of the Silver Wyandottes averaged 86.5 eggs, and the next best 73.3 eggs. What is most striking to South Australians is the position of the Mediterranean breeds, which are so productive in this State. Three pens only of Minorcas were entered, and the best averaged only 37.6 eggs in the six months, the next 34 eggs, and the third 26.6 eggs. The position of the White Leghorns is also poor; out of five pens entered two did fairly well, averaging 78.3 eggs per hen; then there is a big drop, to 49, 47.3, and 38.3 eggs. Possibly the fact that our winter is on the whole milder than it is at Hawkesbury may account for the poor position occupied by the lighter breeds.

Another point that will appeal forcibly to any one who has kept different breeds of fowls is that all were allowed exactly the same ration. This can only mean that some received more than they required, with the possible result that their production was decreased, or others received less than they could have profitably utilized. When we take into account the fact that the breeders would send their best pens, it cannot be said that the results were anything exceptional; only two pens averaged 80 eggs each, and 11 recorded 70 or over, while 15 did not reach 50 in the six months. We believe that many poultry keepers in the State under ordinary conditions could show returns of at least 70 eggs per hen during the six months from April 1. A similar test carried out in this State would be of great educational value, as it would demonstrate very clearly that it is easily possible for the average poultry farmer to largely increase the production of eggs without increasing the food bill.

POULTRY NOTES.

By D F Laurie.

During the next few months a good many cases of disease will be reported, and poultry owners will do well to refer to the articles on diseases which were published in the Journal early in the year. Neglect of ordinary precautions will often end in a serious outbreak; dirty, sun-heated water is the breeding ground of microbes, causing various disorders, which often end fatally. A very serious outbreak of an unknown disease forms the subject of a report issued by the Department of Agriculture, Washington. The reading was like perusing a well-worn book; every line (with the exception of the scientific names) was familiar; the gist of the symptoms and heavy losses described are what are so often related to me in letters. The outbreak was definitely traced to the fact that the poultry in question were in the habit of drinking from a stagnant pool, which received a lot of drainage from manure heaps, &c. This is so common a feature in country districts that more mortality might be expected than occurs. The symptoms generally point to severe diarrhoea, such as is common here, and although much the same dire results accrue from the presence of other organisms, the case in question was interesting as being due to what is scientifically termed a streptococcus. This organism has been found in poultry in this State. I have seen a good specimen, which had been cultivated by Mr. Veterinary-Surgeon Desmond, obtained from a fowl which had died of what is generally termed diarrhoea. It is as well to note that the disease in question was definitely proved to be due to insanitary surroundings, and is therefore preventable. Strong disinfectants destroy the streptococcus in various brief periods, and it is evident whether this or a similar organism has to be guarded against we must pay strict attention to cleanliness, and avoid throwing soft food on excreta saturated soil. The hot weather is the time when nearly all the organisms which cause diseases among poultry are most active, and a pound of prevention is worth a ton of cure, and much cheaper in every way. Without doubt the most difficult lessons to instil are those relating to cleanliness, feeding, and the supply of fresh, shaded drinking water. Readers may sometimes wonder why I revert so much to this point. The reason is that every day strengthens my contention that the due observance of what are erroneously termed trifles ensures true success, while neglect sooner or later ends in disaster. Breeders have appeared quite insulted when I have suggested that their troubles were due to neglect of trifles; yet, on inspection, much surprise was expressed when I pointed out defects such as birds roosting in a draught, drainage from the house and bath, water exposed to the sun, accumulations of old bones, cabbage stumps, and filth generally.

Many people are prejudiced against pure-bred poultry, but the more advanced breeders find that mongrels are less profitable in many ways Crossbreds—that is, the result of mating two pure breeds—are not termed mongrels; it is when a third and a fourth breed is introduced the mongrel element appears. Crossbreds are hardy, but not more so than properly bred pure breeds. The small fancier, who crowds numerous specimens into small insanitary backyards and feeds on all sorts of forcing foods, is responsible for much disappointment, as these pampered birds fall to pieces when let run on a farm where they get no coddling. The American breeders are far ahead of us in this respect: the main points aimed at being purity of blood, type, utility, and stamina, all held equally important. With the majority of our Australian and English breeders show points alone are considered. As I have before stated, it is a well-known law of nature that if any one point be unduly developed it must be at the expense of other points, which may be important. It is common to say that breeders of exhibition stock perfect some show feature to the neglect of utility points. It is very evident that in many cases two forces are at work—the one, the contempt of the breeder for utility points, and the other the law above quoted. He cares nothing for laying powers or suitability for the table, and while unduly breeding for large combs or ear lobes or long legs, allows the law of nature to retain her balance elsewhere. In purchasing stock care must be taken to buy from breeders of repute, and beware of the man who keeps and breeds a dozen varieties: he cannot do them justice. Men who employ help and devote their whole time to their birds find it impossible to do justice to more than five or six breeds, and without help find two or three enough. Some, of course, keep a pen or two for egg production, and do not attempt to breed. The advice of a most successful breeder (an American) was to the effect that one should become famous for and a specialist in one breed rather than attain moderate success with several. By keeping one variety and breeding scientifically and from several pens a strain of the highest merit can be produced, such as can never occur where inferior methods are adopted. Any one who bred and maintained a first-class laying strain could command good prices and unlimited market in this State. A breeder of prime table birds can always command a good market at satisfactory rates. Until, however, some workable form of co-operation such as exists in Denmark or as results from the Utility Poultry Association of England is adopted the actual producer will never get his fair share of the cash paid by the consumer. However, this is a point for readers to settle. Poultry should pay handsomely at average prices; that is, if the results go into the right pockets.

Do not forget that stock which are past the period of profit should be replaced by younger birds. Sentiment is all very well if one or two favourites are concerned, but beyond this losses will result. Hens which have been forced to lay heavily may go at end of second season unless known to be especially good and with an average of over 200 eggs. Separate the sexes as soon as you can; each thrives better, and there is no fighting Look over the young stock, and cull out all inferior specimens—the more room the good ones have the better, and a dozen good ones are worth 50 poor ones.

PRODUCTION OF MILK RICH IN FAT.

[At the annual Congress in September last the question of increasing the per cent. of fat in the milk was referred to. The following article by N. H. J. Miller, Ph.D., taken from Part IV., vol. 8 (1897), of The Journal of the Royal Agricultural Society of England, is instructive in this connection.—Ed.]

The most valuable constituent of milk is butter fat, and the production of milk as rich as possible in fat is, as a rule, the chief aim of dairy farmers. A number of experiments have accordingly from time to time been made with the view of ascertaining whether the fat of milk can be increased by any particular form of food, but without success. It has been found possible, by means of abundance of rich food and increased consumption of water, to increase the total yield of milk; and, according to the nature of the feeding, to obtain milk more or less watery or rich, as the case may be—in fact, such changes actually occur, to a certain extent, in ordinary practice.

Dr. Vieth's results, published in this Journal a few years ago, clearly indicate that there is a comparatively low percentage of total solids during the grazing months, whilst a considerable increase was observed later in the year, under the combined influence of shelter and more dry food. All attempts, however, made to increase the milk fat alone have hitherto failed, and to obtain more fat it has been necessary to use greater quantities of food in order to obtain an increase, not only of fat, but of other much less valuable constituents, such as casein and milk sugar.

In 1868 Professor Wolff, of Hohenheim, stated that "more or less intense feeding is practically without effect on the composition of milk," and in 1870 Fleischer found that the addition of 1 ℔. of oil, or of 4 ℔. of linseed, to the normal food (which consisted of 8 ℔. of clover hay, 40 ℔. of roots, and 10½ ℔. of barley straw), diminished the amount of fat by 0.1 to 0.4 per cent. Gustav Kuhn, of Mockern (1867-68), obtained similar results when 1 ℔. of rape-seed oil, or 3½ ℔. of starch, were given with 20 ℔. of hay.

In experiments with goats, Stohmann found that poppy-seed oil, mixed with hay and linseed cake, induced, in one case, a slightly increased production of fat (0.4 per cent.), in another case no increase. Starch had no effect. On the other hand, feeding with linseed meal freed from fat, instead of with linseed cake, caused in the two experiments a reduction in the amount of milk fat of 0.6 to 1.0 per cent. Other experiments with goats made by Stohmann showed that the substitution of 200 grams (about 7 oz.) of starch and sugar respectively for the same amount of hay gave rise to lessened production of milk fat (0.1 to 1.1 per cent.); whilst the addition of oil to hay had a similar effect. For some time the idea was entertained, though with slight justification, on the strength of Kuhn's experiments, that palm kernel cake would produce the result so much desired. In his first experiments (1870-71) Kuhn found that an addition of 6 ℔. of palm cake with only 4 per cent. fat increased the milk fat by 0.7 and 0.1 per cent. respectively. Subsequent experiments (1872-73) showed an average increase of 0.1 per cent. of milk fat under the influence of 3 ℔. of palm cake; whilst it was found that 2 ℔. of malt germs gave almost exactly the same result.

In the summer of last year Professor Soxhlet instituted experiments at the Central Experiment Station in Munich to ascertain, in the first place, the effect of different foods on the nature of milk fat; he obtained at the same time a number of interesting results respecting the relation of food to the composition of milk, especially as regards the amount of milk fat. As compared with hay alone, feeding with hay and readily digested carbohydrates (such as starch) produced milk poorer in fat. The same result was also obtained when the hay ration remained the same, and the starch (14 lb.) was mixed with water and a little malt, and given instead of water alone. In this case there was no appreciable increase in the yield of milk; whilst the milk fat was diminished by about 0.7 per cent. It is probable that the starch was deposited as body fat. In accordance with the results of earlier investigations, it was found that feeding with large amounts of nitrogenous matter, in addition to hay, induced increased production of milk—at any rate, in the sense that it retarded the decrease coincident with the advance of the period of lactation—but not an exclusive rise in the percentage of fat; and that the percentage of fat in the milk remained the same when 4 lb. of rice gluten (containing 71 per cent. of proteids) was given with hay, as with hay alone. When, however, hay was supplemented with fat, a decided increase of milk fat was obtained, provided that the fat was in a digestible form. When, for instance, sesame oil, linseed oil, and tallow stearin were made into emulsions, distributed in the whole of the water consumed by the cows, milk was obtained containing as much as 5.8 per cent. of fat. With linseed oil (1½-2 lb.) and hay (18-22 lb.) milk was obtained containing, on the average, 5.24 per cent. of fat; with tallow stearin (1-2 lb.) and hay (18-25 lb.) the percentage of fat was 4.24 the first day, and rose to 5.5 per cent. in a week.

These results, showing increased production of fat under the influence of oil, are totally opposed to those of Fleischer and Kuhn, already mentioned, and this divergence is attributed to the different way of feeding adopted in the earlier experiments. Formerly the oil was mixed with solid food, and in this condition it not only remained undigested, but actually interfered with digestion, causing, in Fleischer's experiments, loss of appetite. Emulsified oil, on the other hand, is apparently as readily digested as the oil which is naturally distributed through the substance of oil cake. Stohmann's experiments, in which the effect of linseed meal free from fat was compared with linseed cake, have an important bearing on the subject; but, unfortunately, his results have hitherto remained unnoticed.

The question now arises as to how the increase of fat in milk is produced. The fact that starchy food produces fat which is deposited as body fat, and not in the milk, whilst fatty food brings about increased percentage of milk fat, suggests a direct migration of the food fat to the milk. Professor Soxhlet's results, however, clearly indicate that this is not what occurs. It is true that there was a great reduction (nearly 50 per cent.) in the amount of volatile fatty acids (butyric acid, &c.), which form the chief characteristics of butter fat, as compared with other fats, such as margarine, &c., when the cows received sesame oil, or the residues from maize starch factories, and that these two substances contain scarcely any volatile fatty acids. On the other hand, it is obvious that the admixture of oil with natural butter fat would produce a fat with a much lower melting point. This, however, was not the case. Butter melts at about 97 deg. F.; whilst the oil remains liquid below 32 deg. Linseed oil which has been solidified melts at 3 deg. F. If the milk fat obtained in Soxhlet's experiments were to be judged according to the amount of volatile fatty acids it contained, it would be assumed to consist of about an equal mixture of normal fat and oil. Such a mixture melts at 88 deg., whereas the melting point of the milk fat actually observed was 107 deg.—that is to say, 10 deg. higher than that of normal butter, and 19 deg. higher than that of a mixture of butter fat oil.

A similar effect was observed some years ago by H. W. Wiley. In Wiley's experiments three cows were kept for 10 days on pasture, then fed with gradually increased amounts of unextracted cotton seed meal, receiving finally as much as they would eat. The result showed a rise of over 5 deg. F. in the melting point of the butter, and, coincidently, a decrease in the amount of volatile fatty acids.

The results of Soxhlet's and Wiley's experiments, confirmed by the examination of the milk of cows fed with the residues from maize starch factories, would indicate, therefore, that oily food produces fat of unusually high melting point, and not, as might be expected, of low melting point; or, in other words, a hard and not a soft butter is produced. Soxhlet explains this on the assumption that the oil given in food is consumed in maintaining the temperature, and in the exercise of force; whilst the body fat thus economised migrates to the milk, and that normal butter fat being doubtless a product of the milk glands, its quantity cannot be increased by feeding without increasing the other products of the milk glands—that is to say, the milk as a whole.

Although the results of the experiments described above, as far as the favourable effect of fat given as food is concerned, are opposed to those of previous investigations, they are in accordance with what has for some years been observed in Germany in ordinary practice. At the general meeting of the German Dairy Association held in 1891, Mr. August Dettweillers, of Larbenheim, stated that "in cattle feeding, fat had been too little considered by scientific investigators, and that he had found that by giving palm and cocoanut fat in abundance, the amount of fat in the milk was considerably raised. Similar results had been obtained all along the Rhine." On another occasion Mr. Dettweillers, who is both a farmer and manager of a town dairy, showed that the variations in the yield of butter are coincident with high or low percentages of fat in the palm or cocoanut cake used in feeding. In purchasing such cakes it had therefore become customary to value the fat at the same time as the protein, and to pay 20 pfennigs (about 2½d.) for each percentage of fat above the amount guaranteed.

From the results of his experiments, and of the observations of practical dairy farmers, Soxhlet draws the following conclusions:--In purchasing concentrated foods importance is to be attached to the fat content. Whilst at present the value of protein is estimated at 1.5 times as much as fat, the value of fat in future must be considered, if anything, greater than that of protein, and the amount of fat must be guaranteed. The oil manufacturers must be induced to again furnish oil cakes containing more fat, as in former times, when the methods for extracting fat were still imperfect. If cases occur in which the oily food has an injurious effect on the taste of the milk or butter, this must, according to Soxhlet, be due to other constituents than the fat, since he supposes that the fat of the food does not enter into the composition of the milk, but causes a migration of body fat. An objection will, perhaps, be raised that the depression in the amount of the volatile fatty acids caused by feeding with fatty foods will render the butter liable to suspicion as adulterated with margarine. This has, indeed, frequently occurred. On the other hand, it is not the business of agriculturists to select such foods for cows as facilitate the detection of adulteration by means of the methods now in use. It is rather for food analysts to devise suitable methods for the detection of adulteration, without binding dairy farmers to any particular form of food.

With regard to the physiological process by which milk is formed, Soxhlet considers that his results lend support to the view that milk is a product of the decomposition of organized tissues, either as, according to Voit, the milk glands themselves, or else the white blood corpuscles (Rauber). His explanation of the process is as follows:--Under the influence of food poor in fat, the milk fat is newly formed fat of a peculiar character, distinguished from all other animal and vegetable fats by a high percentage of volatile fatty acids. With food free from fat this normal butter fat can alone be formed in the milk, and its amount cannot be altered by the quantity or quality of the food, even when the food is rich in fat producing constituents (such as starch), or in nitrogen. Abundant feeding with nutritive, but non-fatty, food can only induce increased production of milk fat, by increasing the decomposing milk producing tissues. In this case the other constituents of milk are increased equally with the fat. Large amounts of carbohydrates (starch, &c.), can contribute to body fat, but not to milk fat; because they contribute nothing to the milk producing tissues. On the contrary, carbohydrates, in conjunction with food poor in protein (such as hay), diminish the milk fat, because they diminish the total amount of nitrogenous food—that is, the substances which produce tissues (gland substance, or white blood corpuscles). It is only fat in the food which renders the exclusive increase of milk fat possible by causing a migration of body fat to the milk. In feeding with the usual mixed foods, which always contain more or less fat, it is probable that the milk fat is a mixture of normal fat (produced by the destruction of milk forming tissues) and body fat.

Lawes and Gilbert conclude that the evidence of both common experience and direct experiment indicates that a liberal supply of nitrogenous food favours not only a high yield of milk, but also a high percentage of fat in the milk; and the question arises whether the fat of the milk is wholly or in part a product of the decomposition of proteids. And, as milk is the product of the breaking up of the milk gland, the further question arises—how far the fat results from the decomposition of the proteids of the gland itself—a supposition which, as they point out, obviously involves the difficulty of explaining what becomes of the by-products of the formation. So far as increased production of milk fat, under the influence of a high fat ration, is concerned, the German results are, to some extent, supported by the experiments recently made at the Midland Dairy Institute.

With regard, however, to the nature of the milk fat so produced (an essential point in butter making), Soxhlet's results and conclusions are opposed to those furnished by the Midland Institute experiments. In these experiments, the object of which was to ascertain the effect of oily and nitrogenous food respectively on the amount and composition of milk, three lots—of five carefully selected cows in each—were fed as follows:—Each cow received roots 50 lb., chaff 10 lb., hay 6 lb., and bran 2½ lb. Those of lot A received, besides, linseed cake (with 6.83 (?) per cent. oil) 2½ lb.; bean meal 3 lb., and wheat meal 2 lb.; lot B, linseed cake (with 16.83 per cent. of oil) 4½ lb. and bean meal 3 lb.; lot C, linseed cake (low oil) 4½ lb., and bean meal 3 lb.

	In Food.								
Lot	Fat.	Nitrogenous substance	Nutritive Ratio	Yield of Milk	Fat in Milk	Solids not Fat in Milk.	Total Fat	Milk to 1 lb. of Butter	Total Butter
	lb	lb		lb	per cent	per cent	lb	lb	lb
A.	0·491	2 935	5.67	21·6	3·64	8 71	0·78	26 55	0 81
B.	0 955	2·863	5 96	22 2	3.87	8·67	0 85	24·44	0 91
C.	0·549	3·436	4 71	22·5	3 71	8 81	0 83	25 14	0 89

The above summary shows the amount of digestible fat and nitrogenous matter consumed per head per day, and also the amount and the quality of the milk produced. The results show that, as regards the percentage of fat in milk, and the total fat produced, there was an increase under the influence of high oil cake. The difference was not as great as in Soxhlet's experiments, but it will remembered that Soxhlet gave the cows 1½ to 2 lb. of oil, whereas in these experiments the high oil lot had only ½ lb. more than the low oil lot.

As regards the quality of the butter, the Midland Institute results are entirely opposed to those of Soxhlet and Wiley, the butter of lot B being not hard, but soft, and altogether inferior. The best butter was produced by lot C (high nitrogen), and the amount was not much less than in the case of lot B (high fat). As stated by Sir J. H. Gilbert in a letter to the Director of the Agricultural Department, University College, Nottingham, the "results, as to average yield of milk per head, and less falling off, are in favour of the high nitrogen; whilst the yield of butter is nearly as high as with the high oil; and, taking into consideration the bad qualities of the high oil fed butter and the very high quality of the high nitrogen fed butter, there cannot be a question that a relatively high nitrogen ration is more favourable, both for yield of milk and for yield of butter, than a high oil ration." It may be added that in lot B the average loss of weight of the cows during the experimental period of seven weeks was less than in the other lots, being 8 lb., as compared with 17 lb. (lot C) and 28 lb. (lot A).

The various results which we have considered show that, in feeding cows with oily food, not only the quantity but the quality of the butter produced is affected. As regards "increase" in milk fat, Soxhlet's results, the observations of the Rhineland farmers, and the results of the experiments made at the

Midland Dairy Institute. indicate more or less increase of milk fat under the influence of digestible oil (emulsified oil, or high oilcake). With regard to the "quality" of the butter produced by cows fed, we have, on the one hand, the results of Soxhlet and of Wiley, who obtained hard butter of high melting point, and, on the other, the results obtained at the Midland Dairy Institute, indicating that soft and inferior butter is obtained when cows are fed with high oil cake.

If it should eventually be established by further experiments that feeding large amounts of oil does induce a considerably increased production of milk fat, but that oily food is unfavourable to the production of good butter, such feeding might perhaps be found advantageous where cows are kept for the purpose of fattening calves.

LOCAL AILMENTS IN STOCK.

By C. J. Valentine, Chief Inspector of Stock.

As the Council of Agriculture is making enquiries into common diseases to which stock are subject in the State, the following report by the Government Veterinary (Mr. A. Bickford, M.R.C.V.S.), made in January, 1892, is of interest to stockowners generally, showing as it does the cause of losses of stock amongst farmers some years since:—

In accordance with instructions I visited the farm near Morgan on Saturday, the 16th January, 1892, for the purpose of enquiring into the cause of a fatal disease that prevails among the owner's cattle. It appears that previous to my visit the owner had lost 16, and he had also four or five on his farm that were then sick. The owner informed me that he had occupied his farm since 1882, but that he had not previously lost any cattle from this disease.

I had my attention first drawn to a three-year-old heifer that had been ailing since the 2nd of January. She was lying down, her temperature was 102, and her pulse 80. She looked dull, stupid, and much out of condition. She was slaughtered, and after her death I examined the contents of her belly and chest, without finding any disease. On exposing and examining her brain I at once saw that it had a most unusual appearance. At its base there was a layer of blood that had escaped from its blood vessels. To make myself more certain I solicited the opportunity of examining the brain of another beast. The owner consented to slaughter a six-year-old cow that had been sick for several days. This cow had a sleek coat, and she was also in good store condition, but she preferred to lie, and could not be made to stand up for many minutes. She occasionally chewed her cud, and ate, perhaps, 4 gallons of bran and chaff daily. Her temperature was 103 and her pulse 60. After she was slaughtered her skull was immediately opened and her brain exposed. The appearance of the two brains was almost identical, and I then no longer hesitated to form an opinion as to the true nature of the disease, which is "asthenic apoplexy of the brain," or, in more homely phrase, "starvation apoplexy of the brain."

If cattle are to be kept on a limited acreage, they must have food provided at certain periods besides what the land provides in the shape of grass and bushes. It appears that the cattle were in good condition up to the beginning of December, 1891, when the grass disappeared, and the bushes also began to dry and become less nutritious. This dry, innutritious, and indigestible food produced passive congestion of the vessels of the brain, with resulting watery effusion, hemorrhage, and death. The remedy in my opinion consists in changing the food as much as possible, by sending the cattle into another locality. Of course, it would be preferable to send them to one of the frontages of the River Murray, where if they were fortunate enough to get green food they would speedily shake off all traces of disease.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of November, 1902:—

Adelaide	0·56	Manoora	0·36	Macclesfield	0·78
Hawker	0·30	Hoyleton	0·45	Meadows	0·86
Cradock	0·11	Balaklava	0·15	Strathalbyn	0·56
Wilson	0·31	Port Wakefield	0·18	Callington	0·24
Gordon	0·15	Saddleworth	0·38	Langhorne's Bridge	0·28
Quorn	0·24	Marrabel	0·37	Milang	0·28
Port Augusta	1·11	Riverton	0·50	Wallaroo	0·25
Port Germein	0·83	Tarlee	0·43	Kadina	0·34
Port Pirie	0·58	Stockport	0·30	Moonta	0·16
Crystal Brook	0·95	Hamley Bridge	0·23	Green's Plains	0·16
Port Broughton	0·51	Kapunda	0·36	Maitland	0·36
Bute	0·23	Freeling	0·36	Ardrossan	0·21
Hammond	0·13	Stockwell	0·57	Port Victoria	0·34
Bruce	0·16	Nuriootpa	0·30	Curramulka	0·67
Wilmington	0·44	Angaston	0·61	Minlaton	0·41
Melrose	0·86	Tanunda	0·50	Stansbury	0.45
Booleroo Centre	0·67	Lyndoch	0·46	Warooka	0·30
Wirrabara	0·60	Mallala	0·12	Yorketown	0·31
Appila	0·63	Roseworthy	0·25	Edithburgh	0·30
Laura	0·63	Gawler	0·33	Fowler's Bay	2·44
Caltowie	1·13	Smithfield	0·19	Streaky Bay	0·76
Jamestown	0·73	Two Wells	0·23	Port Elliston	0·53
Gladstone	0·78	Virginia	0·28	Port Lincoln	0·46
Georgetown	0·79	Salisbury	0·23	Cowell	0·17
Narridy	0·95	Tea Tree Gully	0·65	Queenscliffe	0·30
Redhill	0·41	Magill	0·61	Port Elliot	0·51
Koolunga	0·39	Mitcham	0·68	Goolwa	0·40
Carrieton	0·28	Crafers	1·04	Meningie	0·55
Eurelia	0·14	Clarendon	1.77	Kingston	0·70
Johnsburg	0·11	Morphett Vale	0·68	Robe	0·65
Orroroo	0·27	Noarlunga	0·40	Beachport	0·74
Black Rock	0·44	Willunga	0·70	Coonalpyn	0·40
Petersburg	0·76	Aldinga	0·55	Bordertown	0·54
Yongala	0·45	Normanville	0·44	Wolseley	0·41
Terowie	0·63	Yankalilla	0·27	Frances	0·37
Yarcowie	0·40	Eudunda	0·50	Naracoorte	0·44
Hallett	0·95	Truro	0·39	Lucindale	0·53
Mt. Bryan	0·83	Mount Pleasant	0·47	Penola	0·83
Burra	0·62	Blumberg	0·49	Millicent	0·84
Snowtown	0·29	Gumeracha	0·55	Mount Gambier	1·15
Brinkworth	0·27	Lobethal	0·82	Wellington	0·32
Blyth	0·13	Woodside	0·76	Murray Bridge	0·13
Clare	0·40	Hahndorf	0·94	Mannum	0·10
Mintaro Central	0·40	Nairne	0·59	Morgan	0·31
Watervale	0·32	Mount Barker	0·70	Overland Corner	0·32
Auburn	0·35	Echunga	0·77	Renmark	0·52

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford and Company report on December 2:—

A dry November is not an unfavourable month, and as the weather was fairly cool, with the exception of one short spell of heat, and no heavy storms occurred to damage the hay and grain crops, the climatic conditions may be regarded as satisfactory to agriculturists having crops, though the drought continues its relentless grip over a great portion of the country. Some relief has been obtained throughout the worst stricken portions of Western Queensland and New South Wales, as well as along our own north-eastern border by a fall of rain reported as from an inch to even five inches in one spot, but it would need the latter record all over to give the necessary soaking. It is to be hoped this will soon be followed up by further rains to restore the vegetation which has been, some think, almost entirely destroyed by these long rainless years.

In anticipation of a good money return for our wheat and hay crops, business is seasonably active in the city, and in such country districts as give promise of having any harvest, though a further fall in the value of metals is somewhat depressing the commercial outlook. In the droughty portions of th country, however, trade is extremely dull and the outlook most discouraging.

There is a firmer feeling in the English breadstuffs market, but this only interests Australia this season as a buyer of wheat and flour from the United States and Canada. Varying estimates are put forward as to the probable requirements of cereals by importation to the Commonwealth till next year's harvest, and the general opinion seems to be that about 225,000 tons of wheat or its equivalent in flour will be needed in the buying States. As South Australia only will have any surplus to spare, and that estimated at not more than 100,000 tons, a considerable quantity from oversea will be required. Already it is said some 40,000 tons are in transit and being landed from California, and the market there has been advanced 2d. to 3d. per bushel in consequence of this unusual demand from Australia. The harvest prospects in Queensland and New South Wales could hardly be worse, and although in some parts of Victoria good crops will be reaped, the season is more or less a failure over three-fourths of the wheat area in that State, and it is reckoned very little, if any, breadstuffs will reach either Sydney or Melbourne from country districts, so that these cities will have to be mostly fed by seaboard. During the past week a movement has been set on foot in Sydney, and the State Parliament there has passed a resolution asking the Commonwealth Ministry to suspend the duties on breadstuffs and fodder for the year 1903, and politicians in Queensland seem inclined to follow the lead of Sydney. The immediate effect has been to create something like a panic in the local markets, where wheat is being quoted fully sixpence per bushel lower in consequence. That it is proper for the people in those parts of Australia who are suffering from the disastrous drought to relieve their settlers whose stocks are perishing, few indeed will deny, but to remove duties that have so recently been established after an unparalleled long and careful consideration by the Representatives of the whole Commonwealth would be a most unheard of and dangerous procedure. As a consideration to agriculturists who have to pay higher in consequence for their daily requirements owing to the protective tariff, duties were agreed to be levied upon wheat, flour, hay, &c., and now that a season has arrived when these duties will help the farmers who have a little to sell by enhancing the market rates, thus making up somewhat in price for the shortage in yield, it would be a direct breach of faith to attempt to lower values by any such means as are proposed, and most unconstitutional on the part of a State to endeavour to subvert the federal tariff. We cannot, however think it will be even seriously entertained, though meanwhile some little scare has been created. Interstate buyers of wheat are operating here, and it is said Victorians have already secured 20,000 tons. As high as 5/7½ per bushel f.o.b. Port Adelaide, has been paid for a fair sized parcel, but it is generally reckoned this was never justified when we look at American markets and freights. Under the influences referred to, values are about 6d a bushel lower, but may be reckoned to steady up a bit again when present proposals concerning the tariff have been looked squarely in the face. In fodder lines there is the usual tendency to easing rates as new hay, oats, and barley reach market, and as mills resume the output of bran and pollard for which future contracts at lower prices are being made.

The local supply of new potatoes has been hardly sufficient for demand so that a few small lots of old season's growth have been imported to fill up; but the second crop now in sight bids fair to be a fuller one, and the high rates which have ruled are likely to be shortly brought down, so that consumption which has been much restricted may be expected to soon increase. How quickly production may be stimulated in any of the Australian States is shown in the fact that potatoes grown in Western Australia are now being shipped to this port from Fremantle, where there is a surplus at moment more than sufficient even for their large goldfield demand.

Locally onions have been plentiful and cheap, but most of the early samples having been raised on irrigated lands, will hardly stand handling to ship.

In dairy produce heavy business has been put through, the steady shrinkage in local butter yields thus early in the season causing distributors to anxiously look ahead for supplies. Sales have been booked fairly extensively for delivery from cold stores during the early months of the coming year. A steady rise in values here supported by unexpected firmness in Melbourne sent price a week ago up further than it should apparently have gone, as a weakness is now showing. With an exportable surplus of several thousands of tons from Victoria this season and quotations at moment there about 1½d. per lb. above export value to Europe, it is difficult to see how matters can be adjusted unless price goes back a bit. Heavy export demand for eggs kept price moving up, but although quantities coming to market never were so plentiful, orders still exceed supply. Bacon is in good demand, all available finding ready quittance at full quotations. Seasonable trade doing in cheese, but from appearance stocks at midsummer will be unusually light, necessitating, of course, heavy importations later on. New season's honey is reaching market in fair quantities, and is a shade easier, but selling freely; beeswax having fair sale. Almonds in good demand.

A few carcases of veal and pork have been marketed at each Friday's auction sale, but the season is practically ended for fresh meat. Better supplies of poultry have been catalogued, and very satisfactory prices generally obtained, though the dearth of feeding grains still sends forward larger proportions than ordinarily of poor birds.

MARKET QUOTATIONS OF THE DAY.

Wheat.—Port Adelaide shipping parcels, 5/2 to 5/3 f.o.b.; on trucks, per bushel 60 lb.

Flour.—City brands, £11 to £12; country, £10 10/ to £11 per ton 2,000 lb.

Bran and Pollard, 1/9 to 1/10 per bushel of 20 lb.

Oats.—Local Algerian and Dun, 3/ to 3/3; stout feeding, whites 3/6 per bushel 40 lb.

Barley.—Malting, 4/6 to 5/; Cape 3/ to 3/3 per bushel 50 lb.

Chaff.—£5 to £5 10/ per ton of 2,240 lb., bags in, dumped, f.o.b. Port Adelaide.

Potatoes.—New locals £11 10/ to £12 10/ per 2,240 lb.

Onions.—Local, £3 5/ to £3 10/ per 2,240 lb.

Butter.—Creamery and factory prints, 11½d. to 1/1; private separator and best dairy, 10½d. to 11½d.; well graded store, 10d. to 10½d. per lb.

Cheese.—S.A. Factory, 7½d to 8½d.; Imported, 9d. to 9½d. per lb.

Bacon.—Factory cured sides, 11¼d. to 11½d.; farm lots, 10d to 10½d. per lb.

Hams.—S.A. factory, 1/ to 1/1½ per lb.

Eggs.—Loose, 10½d.; in casks, f.o.b., 1/ per doz.

Lard.—In bladders, 9d.; tins, 8½d. per lb.

Honey.—2¾d. for best extracted, in 60 lb. tins; bees-wax, 1/1 lb.

Almonds.—Fine soft shells, 5½d.; kernels, 1/ per lb.

In live poultry fine heavy roosters from 2/1 to 2/7 each; good hens and fair-conditioned cockerels 1/4 to 1/9; a few light coops at 1/2 to 1/3; ducks 1/1 for some light pens, up to 2/ for good table birds; poor quality geese from 2/10 to 3/6; good conditioned up to 4/6; pigeons, 6d.; poor quality turkeys from 6d. to 8d. per lb., live weight, whilst good birds are worth up to 10½d.

Above quotations, unless when otherwise specified, are duty paid values on imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

DATES OF MEETINGS OF BRANCH AGRICULTURAL BUREAUX.

With a view of publishing in the "Journal" the dates of meetings of the Agricultural Bureaux, Hon Secretaries are requested to forward dates of their next meeting in time for publication.

BRANCH	Date of Meeting		BRANCH	Date of Meeting.	
	1902	1903		1902.	1903.
Balaklava ...	—	Jan. 10	Norton's Summit ..	Dec. 12	9
Booleroo Centre ..	—	5	Onetree Hill ...	12	9
Burra ..	—	Feb. 13	Port Elliot ...	20	17
Cherry Gardens ...	Dec. 9	Jan. 13	Port Germein ..	13	—
Clare ...	12	9	Port Pirie ..	13	—
Crystal Brook ...	—	10	Pyap ...	17	—
Finniss ...	1	—	Quorn ...	13	—
Forest Range ..	11	Jan 8	Reeves Plains .	12	Jan. 9
Gawler River .	12	—	Rhine Villa ...	13	—
Golden Grove ..	—	Jan.	Richman's Creek ...	—	Feb.
Hartley ..	12	—	Riverton ...	13	Jan. 10
Johnsburg .	13	—	Saddleworth ...	19	16
Kanmantoo ..	12	Jan. 9	Stansbury ...	6	—
Kapunda ...	6	3	Strathalbyn ...	15	—
Kingston ...	6	3	Wandearah ...	15	—
Koolunga ...	11	8	Whyte Yarcowie ...	13	—
Maitland ...	6	3	Willunga ..	6	Jan. 3
Morgan ...	13	—	Wilmington ...	10	7
Mount Remarkable ...	11	—	Woodside ..	—	Feb.
Murray Bridge .	—	Feb.	Yankalilla ...	5	—
Nantawarra ...	10	Jan. 7			

CONFERENCE OF AGRICULTURAL BUREAUX.

Held at Angaston November 5 and 6.

The delegates present were:—Kapunda, Messrs. Flavel, Morris, and Correll; Gawler River, Messrs Roediger and Bray; Rhine Villa, Messrs. Vigor and G. A. Payne; Saddleworth, Messrs. Plant and Benger; Gumeracha, Messrs. Bond, Monfries, Lee, Cornish, and Hanna; Tanunda, Messrs. Graetz and Trimmer; Angaston, Messrs. W. and A. Sibley, Swann, Thorn, Player, Heggie, Smith, Radford, Friend, Vaughan, Sibley, and Salter. Professor Towar, Professor Perkins, and Mr. G. Quinn were present, as well as a number of visitors.

During the morning the visitors were driven to the Angaston marble quarries, and they also inspected several well-kept orchards. Mr. W. Sibley (the Chairman of the Angaston Bureau) presided at the Conference, which met in the Institute Hall.

The Chairman extended a hearty welcome to the delegates from other Agricultural Bureaux and to the visitors. The Bureaux, he thought, were doing a considerable amount of good in the State, as the communication of valuable advice from one member to another was certain to result in benefit to all. He felt confident their deliberations would be attended with success.

Mr. P. Trimmer read a paper on

CO-OPERATION AMONG FRUITGROWERS.

There was urgent need for the better handling and distribution of fruit crops, and he advocated the formation of fruitgrowers' associations in each fruitgrowing centre. An association was formed at Angaston some years ago, and it was through its efforts that some apples were shipped to England from Barossa, and they realized top prices. The association had practically become extinct through the apathy shown by orchardists. The objects of an association should be to obtain and distribute information respecting local and foreign markets for fresh and dried fruits, and the suppression of pests; to arrange local packing places for fruit, and promote, as far as possible, the principle of co-operation in the disposal of fruit, and to adopt a uniform system of packing, grading, and branding for export. If there were an association of that kind they could employ reliable packers, and get their fruit "put up" in a uniform manner. The one brand would thus become known, and sought after. They could even go so far as to contract to supply the buyers, in the same way as the Tasmanians did, for several years ahead at a fixed price per case, free on board. In the event of storms interfering with the crop, and thereby upsetting calculations in regard to space required on vessels, an association could always buy more easily than private individuals. The small grower, who now had little chance in competing with the large grower, would obtain great benefits from belonging to an association. Several small growers living in the same vicinity, instead of having a spray pump each could have one good pump between them, and could assist one another with the spraying. Small growers with, say, 50 or 100 cases of apples would not trouble to ship them. They would probably foist them on the local market, and get starvation prices from the packers, who made their own prices at present, but who could not do so if they had to buy through associations. If these small growers belonged to an association they would have the benefit of being able to secure cases, packing material, &c., at a much less cost than if they bought individually from the merchants. The more persons there were shipping fruit on their own account, as at present, the more unsatisfactory would be the results, as there were certain to be some among them who would not mind squeezing in a small apple to make large ones fit the case, little thinking that when the case was opened it would be condemned. Orchardists now mostly sold to private packers at from 3/ to 3/6 per kerosine case delivered to a packing shed. There the fruit was sorted over, and that unfit for packing was put aside till the owner called with another lot. This system had proved unsatisfactory, as often "rejects" had been given to a grower who never had such varieties in his orchards. He advocated the packing of all lots of 100 cases and over on the growers' property. There was no doubt the fruit got less handling and bumping about, and could be graded as it was picked from the trees. If any member intended to increase his plantation he could obtain cheaper trees through an association than otherwise. In the Barossa district there were facilities for growing almost every kind of fruit, and there were acres upon acres on the range where strawberries, raspberries, and suchlike fruits could be grown to perfection, but without proper means of transit no one would attempt to plant them. They would start to can or make jam of the fruit if they had direct railway communication. He thought it was high time steps were taken to safeguard the soft fruit trade. This was being done by the raspberry growers of Forest Range, and associations could strengthen the position of growers by undertaking to dry certain proportions of the crops when they were heavy. Outside markets could be better exploited, and buyers would not feel so insecure in dealing with separate individuals.

Mr. F. Salter thought the paper had suggested lines upon which experiments might be made. In that district private enterprise had proved more successful than companies. He believed everybody should only ship first quality fruits. Mr. Cornish was afraid co-operation was not entered into with a proper spirit, and jealousies ruined most of the ventures of this nature. There was no doubt in the past private individuals had managed businesses more economically than companies. There was no reason why co-operations should not succeed if properly managed. Mr. S. O. Smith thought care was needed in formulating the inner workings of such schemes. Co-operative dairies and fruit-canning companies had not been a success in that district, but the causes for such failures were known and might be largely avoided. What was wanted in running such a co-operation as had been outlined was strong able men. What was possible in Denmark in dairying should be possible here in fruit culture, as we claimed equal intelligence, though we might lack the mutual trust which was necessary to success. Last season four buyers were canvassing the district buying apples for export. If it paid them to come here it should pay the growers to band together and appoint some person to do the packing and transit work for them. Mr. W. A. Lee considered co-operative companies should begin with a lot of capital behind them. In the past co-operations had failed through the shareholders not sticking together when the trial came. Many people only saw good in such societies while they were being paid more for their produce than outsiders offered. If a temporary, perhaps, fictitious rise in the price took place, they drifted away from the society which had stood them in good stead when prices were low. Mr. Swann spoke from the experience of a dealer in dried fruits in that locality. The need for co-operation was great, and he believed by December or January plenty of apricots would be wasting on the ground in that neighbourhood. The different grades of dried apricots submitted to him were enough to convince any one that if co-operation did no more than cause an even quality to be produced it was necessary. Some lots were black, others golden and a sight to see. Some were not sulphured at all, others overdone with the fumes, and there was no uniformity. With co-operation there was reason to expect better grading and packing, consequently an improved price. Unless some binding agreement is made weak persons always are seized with fright and sell. Co-operation would probably be as valuable to the producers in purchasing as in selling. He believed over-management had killed co-operative efforts in Angaston in the past Professor Perkins thought that co-operation among the fruitgrowers in the Angaston district was necessary to the proper disposal of their produce. They need not adopt any costly system of co-operation. The Conference should pass a resolution on this question, and he would like to see a committee appointed to deal with the subject. Mr. Quinn spoke of the advantages that attended co-operative action in other parts of the State. It could be conducted in a small way at Angaston without the expenditure of much money. He mentioned the remarkable evenness of grades of fruit sent to Adelaide from Renmark, one case being similar to another right through the consignment totalling 500 cases. Mr. Correll spoke from personal experience of the advantages the Farmers' Co-operative Union had given to the agriculturists. Mr. J. Hague had experience with the difficulties named by Mr. Swann in connection with dried fruits. At Renmark they combined for the purpose of preparing their fruits for market, but dried independently. They then appointed an agent to dispose of it. This gave confidence to the buyers, and that was the first consideration. It seemed they needed to get the fruit together at some central place to sort, grade, and where possible, value it. The weeding out necessary to even grading would not suit some people. His experience in co-operation had not been very satisfactory. Every shareholder expected his fruit to be paid for at best prices, and the manager was hampered as he only wanted good fruit. General merchants have advantages over country companies, because they have business connections in many countries and places, and had not so much difficulty in finding markets. Mr. Thorn thought in the packing of apples they had the Government Depot to do the shipping and selling, and they should be equal to packing the fruits and forwarding it to the Depot. He thought they might begin in a small way and work up gradually.

THE BREEDING OF POULTRY.

Mr. J. Monfries read a paper on "Poultry." The full text of which was printed in The Journal of Agriculture, November 1, 1902, page 308.

Mr. Vigor believed the Murray Flats could not be beaten for egg production. The cross between Minorca and Brown Leghorn was good, but for table poultry he liked a touch of the Indian Game. Mr. Roediger had crossed the Minorca with common fowls, and found them good layers. He had proved it paid to feed heavily. Mr. Bray doubted if it paid to shut poultry up and feed them with bran at 1/6 per bushel. He found them useful in picking up vermin. Mr. Thorn believed in pure bred fowls. The heavier breeds were easily kept in their proper places, but Brown Leghorns were difficult to keep out of gardens. He believed the Black or Buff Orpingtons would suit that district. There was not much profit in it after buying food for fowls. One required to grow the food. Field peas, maize, and a little wheat, made a good ration. The fowls in the orchard appeared to find something around the trees, probably vermin. Mr. Player said his fowls paid for the food and trouble, though he only kept a few. At Moculta he had seen mobs of turkeys and he had known 80 gobblers to be sent away in a batch. Young birds 10 months old averaged about 13 lb. weight. Mr. Plant believed poultry paid the farmer well. He kept a good many, and they gave an average return of about 15/ per week. This paid for the groceries. Mr. Flavel thought the reason why fowls did not pay some people was because they did not feed them. Chickens should be raised before the weather became too hot. Eggs should be sold by weight. Every district would probably vary in the kind of fowl which would prove profitable there. Mr. Payne considered poultry paid, but they should not be shut up. The Minorca crossed with Leghorn, if properly attended to, would pay even if wheat were £1 per bag. Mr. Hanna had tried different strains, and believed he had improved by crossing the Wyandotte and Langshan. They proved to be excellent layers and good table fowls. Much depends upon the feeding. Turkeys should have their own way to roam and breed at large. They would bring the young home. He had realized 6½d. per lb for a van load raised in this manner. He believed in selling by weight, the same as with other meat. The present method was primitive and unfair. Mr. Benger thought fowls had been the backbone of the farm, where crops had failed. Owing to the great diversaty of breeds, we could get some kind to suit pretty well any climate. Poultry had paid him better than anything else on the farm. From seven or eight geese he had raised over 50 young birds, which at Christmas brought 3/6 each. The flesh of poultry also saved the use or purchase of other meat, which at present was a considerable item. Mr. Trimmer believed in keeping fowls closed up properly. He gave them thick milk, lettuce, and mangel tops, and found the eggs and flesh profitable. Mr. Monfries, in reply, said Leghorn and Minorca were good laying strains, but they were great flyers. Fowls shut up properly will pay, but not in a wire-netting yard without shelter. Thickly feathered, heavy breeds were better in cold climates. The better they were fed the more profitable fowls became. Respecting ticks he believed persons should be careful about bringing fowls from the city or known infected areas. Fowls in winter did well on peas, barley, wheat, and meat. Rabbits have been boiled down systematically as feed for poultry, and the results were good. He had bred turkey gobblers, which at eight months old scaled 22 lb., and sold at 6d. per lb. Young turkeys were easily affected by cold and wet, and require to be fed on wheat and hard foods until six weeks old. Incubators were valuable in the fact that they would raise chickens when no broody hens were available, and the early raising of birds was important.

THE TREATMENT OF PEACH TREES.

Mr. Quinn in the evening delivered an address on the "Treatment of Peach Trees." He advocated the natural stock for the peach tree. Complaints had been made during recent years that a number of young peach trees received from the nurseries did not thrive well on being transplanted. Although they appeared to be well grown, they did not flourish, and he attributed this to a forced growth late in the season, and to the fact that the trees were not allowed to mature properly. With the aid of a blackboard he showed how to prune a tree from the time it was received from the nursery until it reached the fruit-bearing stage. A short stem was recommended, and he thought that five or six main branches to a tree were, on the average, sufficient. The peach bore fruit on wood that had grown during the previous summer, and it was necessary to make provision for fruit-bearing spurs, not only for the approaching season, but for the one that was to follow. The treatment of the peach was somewhat similar to the spur-pruning of the grape vine. The necessity of removing in the springtime laterals where they were too crowded, so as to let more light into the tree, was dealt with. The removal of barren shoots which had been left to carry fruit, but on which none had set, was also very important if the fruit-bearing parts of the tree were to be kept reasonably near to the main branches. The curl leaf fungus could be best prevented by spraying with Bordeaux mixture just when the flower buds were opening. The importance of checking the black aphides at the outset was touched upon. Tobacco and soap, at the rate of 1 oz. of the strongest tobacco and 4 oz. of soap, to 4 gallons of wash, being recommended as a spray. The superiority of fumigation over spraying was touched upon, and the speaker expressed an opinion that this method of dealing with the pest would eventually supersede all others.

Mr. S. O. Smith asked what was the objection to the almond stock, as they had peach trees 25 years old still thriving on almond stocks. Mr. S. Plush endorsed the statement respecting the value of the almond stock in dry soils.

Considerable discussion took place on the treatment and habits of the peach aphis. Several members had found that bands placed round the stems and coated with some sticky compound effective in preventing the aphis from crawling up the trees. Mr. Quin strongly recommended fumigation as the most effective method of dealing with the pest. If the treatment was properly carried out all insects within the tent would be destroyed, but the fumes would not penerate the ground. In regard to the idea that the aphis lived and bred upon the roots of the peach, he was not satisfied that the evidence on this point was at all conclusive. Mr. Plush said he had found the aphis on roots a foot away from the stem. Mr. Bray enquired whether any varieties were less liable than others to attack; the Early Crawford seemed to him to suffer less than other kinds.

THE SOIL AND ITS TREATMENT.

Professor Towar gave an address dealing with various phases of this subject, which had come under his notice of late. He referred to the various agencies which reduced the rocks to soil, and which rendered the plant food available to the roots of plants. The use of cover crops to be ploughed under while succulent was mentioned. Many successful American farmers never used a single ton of what were generally termed commercial fertilisers, depending mainly on green manure crops, and coarse farmyard manure to keep up the fertility of the soil. From this it might be inferred that these commercial fertilisers were not necessary to successful farming. From various analyses of South Australian soils he had seen it did not strike him that so much phosphoric acid was needed; in fact, the average soil contained more phosphoric acid than would be removed by a century's cropping, but of course, these analyses did not show in what form this was, and it was here that analyses failed the farmer. It was not only the quantity of any plant food that determined the treatment, but the actual condition of such food, the physical condition of the soil, the presence of beneficial germs, situation, &c., all had a considerable influence in the results that would be obtained. He thought the reason why such small dressings of super gave such satisfactory results, was that the young plant finding a ready supply of food to hand, the roots grow vigorously, and are afterwards enabled to seek what they need from the store already in the soil. The Professor also referred to the growing of clovers and other leguminous plants which took from the atmosphere some of its nitrogen. If such crops were harvested the roots left in the soil enriched the land, as in addition to this nitrogen the deep-penetrating roots dissolve and bring up from the lower strata plant food which becomes available for the succeeding crop. Those farmers who grow peas have noticed that the land carries better grain or hay crops afterwards. Where it can be grown the Crimson clover was one of the best of these crops to grow for ploughing under. Where clover cannot be grown, peas, beans, or lupins should be tried. The benefit of under-draining especially in moist districts was also referred to; it was better to carry off the surplus moisture by underdrains than to let it run off the surface. The soil actually benefits by the water being drawn downwards to the drains, but injury results where it runs away over the surface. They must always remember that well-drained soils retain the moisture better in dry weather, and crops suffer less than on soil that is overcharged with moisture during the winter.

Mr. Hanna said his experience was that growing a crop of peas did the succeeding hay crop more good than two cwt. of phosphate. Peas, were also a profitable crop to grow, their yields being up to 20 bushels per acre. Mr. Rundle referred to the difficulty of getting green manure crops early enough to plough under in time to get them rotten, except in heavy moist soils. In reply to questions, Professor Towar said that in America, they found it best to cart stable manure direct from the stable to the field and plough it under, as the soluble plant foods were to a large extent lost when rotted in heaps or pits. There was no doubt they would benefit their soils by adding organic matter. The moisture holding capacity of the soil was largely dependent upon the per cent. of organic matter in it. Not only so, but the presence of moisture and organic matter assisted in dissolving and making available for the plants the food already present in the soil.

STOCK.

On Thursday afternoon, Mr. Jas. Rundle, manager of Tarrawatta Station, read a very instructive paper on Sheep, Cattle, and Pigs. Dealing first with merino sheep, he advised the selection of the best rams and ewes for breeding purposes. A few ewes of extra merit from which to rear stud rams should be kept separately. It was important to obtain stock from breeders with long-established reputations. The best merino was shapely, well grown, of sound constitution, evenly covered with a dense, bright wool, and a good length of staple. They needed about 2½ per cent. of rams to 100 ewes, and nothing would be gained by increasing the percentage. It paid handsomely to employ a man to look after the ewes and lambs continually during the lambing season, so that accidents might be immediately detected. Many fatalities occurred owing to lack of attention. Lambs required a change of pasture more so than grown sheep. During the first three months, at least two shifts should be made, otherwise the lambs would become weedy. With several changes the lambs became almost free from dirt and from scour. In one paddock at Tarrawatta during the present year they had lost 13 out of 616, and out of the remaining 2,850 a like number, a total of 26 deaths from marking to shearing as against 116 deaths last year for the same period, with 700 lambs less. The majority of their lambs had turned the scale at from 50 to 65 ℔. Last year their lambing return realized 73 2-3 per cent., with an average clip of 2 ℔. 2½ oz., as against 82½ per cent. and 2 ℔ 9 oz. for the present year. He attributed that result to careful attention during the lambing season, keeping the ewes on good grass and water, with plenty of shelter, occasional changing, and at all times having access to salt. Sheep would fatten very quickly if removed from the large paddock in which they had been running for the greater part of the year into smaller ones, splitting up the flocks. It was adivsable to grade them and have a few small paddocks securely fenced. These should be allowed to rest in the late winter and early spring, and a dressing of manure should be applied. Growth would be quick, and by September the grass would be difficult to keep down. They always endeavoured to rest completely or partially every paddock on the run during the spring. For the past fortnight they had had 866 two-tooth ewes on 95 acres. If they remained there for another week there would still be a fair amount of feed. A paddock of 900 acres was resting. Salt was absolutely necessary for sheep. In addition to ensuring health it brought in a handsome return in both frame and wool. At Tarrawatta salt was placed near the waterholes, because by doing so crushing was avoided. For dairy purposes he liked the shorthorn-Jersey cross, although the Ayrshire-Jersey cross made a splendid cow. The best cow he had seen in the States was a shorthorn-Jersey cross. Her milk yield was 56 ℔. a day and butter yield 15 ℔. weekly. The champion cow of England for the past three years was a Guernsey shorthorn cross. Her milk yield was 63 lb. a day, and butter 19 lb. 8 oz. per week. The first prize cow at the last Melbourne Show was an Ayrshire-Jersey cross. It was most important to select the cows, and especially bulls from old and tested milking strains. It never paid to run the calves with the cows. They should be taken away, and given daily about a quart of milk and a little boiled linseed. Experience had proved that under that treatment they thrived splendidly. Maize and mangolds should be grown. The former required a very firm bed, but a loose surface, and under irrigation grew rapidly Impaction, or "dry bible," had effected great mortality. The treatment he advised was a drench of 1 lb. Epsom salts, a bottle of raw linseed oil, with a pint of treacle. Hard, dry food should not be given, and frequent injections of warm water should be made. Many people held strongly to the Berkshire as the most profitable pig to breed and keep, but at present that type was completely out of it. There were those who would not breed or keep any animal unless it were pure, but that was a fad. The most profitable pig was the Berkshire-Tamworth cross. It would grow faster and mature quicker than any other. Tamworth sows would rear 25 per cent. more young than the Berkshire. Pigs as a rule were sadly neglected, and were reared in absolute filth. The sows should have a grass run, divided in the centre, and alternately occupied. Each yard should contain a wood-slabbed shed facing the south-east, with plenty of clean straw. Clean water, salt, and charcoal were important essentials. The best and most economical food was crushed and scalded barley and wheat, or peas mixed with skim milk.

A comprehensive vote of thanks to the Chairman, the speakers, and all who had assisted in the proceedings closed the Conference.

Warts on Stock.—"Many breeders of show cattle are often troubled with warts growing in very conspicuous places on their prize animals," says Professor A. L. Cottrell, of the Agricultural Experiment Station in Kansas. "We had such trouble with the pure blood stocks, and several successful methods were employed in their extermination. In order to experiment on taking off the warts a Red Poll heifer was selected on which the warts were so thick that it was impossible to place one's hand on her without its coming in contact with several large growths. We tried two different ways on different parts of the animal's body. On her head and shoulders we applied castor oil—well rubbed in—twice daily for a week. Shortly after each application a portion of the wart would scuff off, and in two weeks the warts were entirely cured without any pain to the animal in any respect. On the back and hips of the same heifer we used concentrated acetic acid, applying it with a fountain pen filler, and soaking the wart up thoroughly after applying grease around the root to keep the acid from eating the flesh. About 12 hours after the operation the warts could be pulled out easily. This was the quicker way, but it caused considerable pain and irritation, and is accompanied by some danger of the acid being dropped upon the skin and thereby causing trouble. Of the two methods the writer recommends the former, unless the time is limited and immediate results are desired. Dairy cattle are very commonly troubled with warts on their teats and udders, oftentimes producing nearly a deformity. This can be easily overcome by applying castor oil after each milking, and the wart is removed without causing any soreness or discomfort to the cow."

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AGRICULTURAL BUREAU REPORTS.

Bute, October 14.

Present—Messrs. Brideson (chair), Barnes, Hamdorf, Trengove, A. and H. Schroeter, Ebsary, Gitsham, McEvoy, W. H. and A. Sharman (Hon. Secretary), and two visitors.

Takeall.—Mr. A. Schroeter read a paper on this subject. His experience was that early fallowing was not a preventive of takeall. He had had it worst where the land had been worked when damp. In his opinion, fire caused takeall. Paddocks burnt year after year suffered from the trouble. Considerable discussion ensued, and it was decided to see whether the Department could do anything in the way of having soil from a takeall patch and from healthy crop alongside analysed to find out whether anything in the soil or a deficiency of any matter was the cause.

Reeves Plains, October 17.

Present—Messrs. George (chair), Folland, Arnold, Hancock, W., Henry, and Hubert Day, Jenkins, Oliver, P. Marshall, Dawkins, Corden, McCord (Hon. Secretary). R. Marshall (Council of Agriculture), and a number of visitors.

Improvement of Wheat.—This meeting was held at Mr. P. Marshall's homestead, the visitors spending a very profitable day inspecting the farm and the crops, particular interest being shown in the experimental wheats. Mr. Marshall, sen., explained the source of many of the new crossbred wheats, some of which were very promising. He explained the method of crossing, and how he had hoped by the utilization of different wheats, possessing certain desirable characteristics, to secure crossbred varieties superior to the parents, and possessing the good qualities of both. A number of the new wheats they had raised answered their expectations in every way. The work of fixing a new variety was, however, tedious. He considered in most cases it took at least seven years of constant culling and selection. Members and visitors were entertained by Mr. Marshall at the conclusion of the inspection.

Dowlingville, October 17.

Present—Messrs. Montgomery (chair), Burkin, Mason, Watkins, Crowell, Lock (Hon. Secretary), and three visitors.

Black Rust.—Discussion on this subject took place, there being considerable difference of opinion as to cause. Messrs. Montgomery and Mason found certain varieties more susceptible than others. They had each sown portion of a parcel of seed, the balance being sent to another part of the State. In each case the crop was badly affected by black rust; while other wheats alongside, sown under exactly similar conditions, were not affected to any extent.

Cross Drilling.—Mr. Crowell stated that he put in a paddock with Cape oats, drilling both ways. Two bushels of seed and 1 cwt. of manure per acre were applied. The crop came up thick and regular, and was the better for cross drilling.

Lyndoch, October 16.

Present—Messrs. Kennedy (chair), Warren, Rushall, Springbett, Woolcock, Mitchell (Hon. Secretary), and two visitors.

Business.—Mr. Warren reported that he had inspected crop on Mr. Kennedy's farm, where the land had been cross harrowed after the drill. The effect on the crop was very marked. He had also seen in the neighbourhood some badly grafted vines, the bud of the scions being covered 2 in. to 3 in., and the soil caked so hard that it was impossible for the shoots to come through. Some discussion took place on manures.

Pyap, October 17.

Present—Messrs. Bowes (chair), Napier, Axon, Robinson, Holt, Rogers, Cox (Hon. Secretary), and three visitors.

Congress. Delegates reported on proceedings of Annual Congress, and on visit to Roseworthy College.

Summer Treatment of the Vine.- The Hon. Secretary read article from Farmers and Fruitgrowers' Guide of New South Wales on summer treatment and cultivation of the vine.

Milk Fever.—Mr. Holt read article from interstate paper describing Schmidt treatment of milk fever by the injection of iodide of potassium. Mr. Drogemuller (visitor) recommended the use of arsenicum, aconite, and belladonna alternately for this complaint. The Chairman read clipping dealing with the treatment of the dairy calf, which was well discussed.

Dawson, October 18.

Present—Messrs. Renton (chair), Severin, Collins, Kilderry, and Meyers

Robbers and Wasters.—Mr. Daniel's paper on this subject was discussed, and the following resolutions carried:—(1) No more horses and cattle should be kept on any farm than are actually necessary for the working thereof; (2) that no more poultry than are profitable should be kept, the number being regulated in accordance with the season—the Minorca was considered the best fowl for this district; (3) no hard-and-fast rules as to implements can be laid down—in each locality those best suited to the special conditions must be used; (4) in no case should farmers crop right up to the fence—where possible, strips 5 ft. to 6 ft. should be left.

Roadster Horses.—Discussion on this subject took place. Members are of opinion that the best roadster is got by mating a blood stallion to a medium draught mare, and in no case should the roadster horse be kept as a stallion.

Scales Bay, October 25.

Present—Messrs. Roberts (chair), Plush, A. and G. Newbold, Aitchison, R. G. and D. P. Thomas (Hon. Secretary), and two visitors.

Axe Handle.—Mr. Newbold tabled sample of axe handle made from sheaoak wood. The wood was split to 1½ in. x 2 in. lengths, smoothed with an adze, and then the shape of the handle marked. Shape with an adze and finish with drawknife and sandpaper. Adze handles could be made in the same way, the wood being tough and durable.

Does Farming Pay?—Mr. D. P. Thomas read a paper on this subject, showing that with an 8-bushel average the farmer on the West Coast has a balance of £240, after payment of rent, rates, taxes, interest on capital, depreciation, &c., to cover the value of his labour, and of any labour outside his family that he may employ. [Full details of estimate are given in separate article in December issue of Journal of Agriculture.—Ed.]

Mount Bryan East, October 18.

Present—Messrs. Dunstan (chair), Bryce, J. and E. S. Wilks, Quinn, Thomas, Honan (Hon. Secretary), and one visitor.

Annual Meeting.—The Hon. Secretary read his annual report, and delegates to Congress reported on proceedings. Messrs. B. H. H. Dunstan and E. S. Wilks were elected Chairman and Hon. Secretary respectively for ensuing year.

Harvesting Peas.—Mr. J. Wilks wished to know best method of gathering, threshing, and cleaning peas. [Can some member advise on this subject. —Ed.]

Mundoora, October 17.

Present—Messrs. Harris (chair), Beck, Tonkin, Mitchell, Shearer, Aitchison, Angley, Gardiner (Hon. Secretary), and one visitor.

Shallow v. Deep Cultivation.—Mr. Shearer called attention to the fact that the crops on shallow cultivated sandy land were doing best this season. A neighbour broke up a field last winter for fallow, a portion with the plough, and the rest with a cultivator. At present the crop on the latter portion was far superior to the other, and it could be seen to the inch where the ploughing finished. The Chairman's experience was that deep cultivation gave best results in good seasons, but in dry years the shallow worked ground did best. Other members' experiences were similar. The Hon. Secretary only fallowed sandy land to depth of 3½ in., and would plough under as much straw as possible. The Chairman and Mr. Aitchison found that where the stubble was burnt off they got best results.

Renmark, October 16.

Present—Messrs. Rose (chair), Waters, Forde, Turner, Johns, Nuthall, Kelly, Geneste, Chapman, Millar, Moffat, and Cole (Hon. Secretary).

Marketing Fruit.—Captain Moffat read paper by Mr. Barnes at Mildura, advocating co-operative marketing of dried fruits. Members generally supported the writer's contentions. Captain Moffat was sure the sale of dried apricots and peaches could be largely extended if the public were instructed how to prepare them for table. [Why not send on proved recipes for simple dishes for publication in The Journal of Agriculture?—Ed.] He also referred to the practice of certain merchants in Adelaide of passing off inferior fruit as Renmark fruit; whereas it had not been produced here. Visitors to Renmark often expressed surprise at the flavour of the local fruit, and contrasted them with the article usually obtained in Adelaide.

Humus.—Mr. J. A. Forde read a paper on this subject:—

He read Professor Towar's remarks at the Annual Congress, and expressed the opinion that they applied with great force to Renmark, where the practices he condemns are carried to extremes. In the irrigation settlements the ideal block is one on which not a weed is allowed to grow, the soil being cultivated once or even twice a month, constantly turning up new soil to the surface and burning out the humus. The result of the destruction of humus is very marked at Renmark. Soil which eight years ago was a rich sandy loam, producing a wealth of vegetation, and never caked, has now become harsh and gritty, liable to cake, and which will grow nothing without the aid of fertilisers. The most clayey soils are becoming closer in texture, and less capable of absorbing moisture; the sand becomes more porous, and allows the fertilisers to be leached below the roots. All authorities agree as to the effect of constant cultivation, and the destruction of the humus, and his own experience agreed with these conclusions. He had some young orange trees doing badly, so he took out a trench 1 ft. wide and 9 in deep, filled it with water in which sulphate of ammonia was dissolved, and when this had soaked in threw back the dry earth. Although watered every two weeks or so, they made no improvement whatever. Removing the soil months afterwards he found the sulphate recrystallized. A good dressing of super was applied in a trench, but this had no effect. He then dug a trench about 2 ft. wide round each tree, nearly filling it up with stable scrapings and sand, and sprinkling in super and sulphate of ammonia, then turned in water. Within two months the trees began to put out new growth, and now they are vigorous and covered with blossoms. He found the most economical method of watering single trees was to open a trench, fill it up with water, and put back the dry earth when the water had soaked in. Where the stable manure was applied the soil kept wet from one watering to another, although the ground beyond had dried. The question of greatest importance to them was how best to restore the humus. They could not get sufficient stable manure, and the only way, therefore, was to grow green manure crops. In reference to stable manure they might make better use of the small quantity available. It was waste of labour and good material to spread it on the surface and leave it; if any benefit is to be obtained it must be ploughed under at once, but most good will be secured by burying it thoroughly. He ploughed a strip about 8 ft. wide, throwing the soil right and left, going as deep as possible. Then with a pair of mouldboards on a one-horse cultivator he scooped out the soil as well as he could, ploughing again in the bottom in the same way; by this means opening out a trench about 2 ft. wide and 1 ft. deep, which he half-filled with stable scrapings, then reversing the mouldboards draws the soil back. The strip treated in this way is improved for several years. In California exhaustive experiments have been carried out to determine the best plants to grow for green manure, and as a result the Agricultural Experimental Station recommend various leguminous plants, of which they say "These combine all the points required of a green manure plant, viz., nitrogen, absorption from the air, deep rooting, and succulence, which is conducive to quick decay." Seven kinds of lupin are referred to, the yellow being considered best. In addition there were plants that could also be used for fodder, such as clovers, beans, peas, vetches, &c., and these were to be preferred where they will thrive. The hairy vetch is stated to have yielded 17½ tons of green feed per acre.

The Hon. Secretary tabled a plant of small blue lupin. He had sown this to ascertain whether it was succulent enough to rot quickly, as many other plants tried were too woody and rank. The lupin proved very suitable, and should be tried as a green manure crop. It was decided to make enquiries for seed of various plants suitable for green manure crops.

Willunga, November 1.

Present—Messrs. Blacker; Richards, Hughes, Binney, Valentine, A. Slade, E. M. Slade (Hon. Secretary), and two visitors.

Homestead Meeting.—Members met at residence of Mr. Valentine. Considerable interest was shown in the outbuildings and the various conveniences attached thereto. The stock also came in for favourable notice. Of the crops, the first inspected was a paddock of Gluyas wheat, cut for hay. Portion of the land had previously grown a crop of peas, and it was easy to detect in the stubble the effect of this treatment, the growth being much stronger than on the ordinary fallow. A splendid crop of oats on last year's fallow was also seen: portion had received stable manure, and here the growth was much stronger. A 40-acre piece of Talavera wheat on fallow land of a limestone nature was the best seen. One cwt. manure per acre and 46 bushels of seed to 40 acres were put in about the end of April. The crop in some parts was nearly 6 ft. high, and would average over 5 ft. Estimates of the yield varied, some of the visitors being of opinion that the 40 acres would yield fully 100 tons of hay.

Peach Aphis.—Members reported that this insect had been very prevalent. Almond and apricot trees had been badly attacked, and spraying seemed quite ineffective.

Crops Dying.—Some of the cereal crops, especially in stubble land, have dried up in patches. Members would like to know the cause and the best remedy.

Clarendon, November 10.

Present—Messrs. Piggot (chair), Morphett, Phelps, Payne, Harper, and Wright.

Forest Range Conference.—Several members reported on visit to Forest Range, and on matters of interest seen on the return journey via Mount Barker. The general effort to cope with the codlin moth pest in several districts was very noticeable. The growth of red clover about Mount Barker suggested the wisdom of growing it in this district on account of its value for feed.

Planting and Working an Orchard.—Mr. W. A. Morphett read a paper on this subject. He advised thorough preparation of the land before planting, careful attention to pruning, particularly the first few years, and good cultivation. He would not grow other crops, except potatoes, on land planted to fruit trees. When planting spread the roots out carefully and cut the tree well back. The grower requires to have a good knowledge of the fruitbearing wood and general characteristics of the different trees he is growing before he can expect the best results from his work. For this district the low, umbrella shaped tree was most suitable.

Yankalilla, October 31.

Present—Messrs. Kelly (chair), Crawford, Leverington, Gardner, Tonkin, Heggarton, Wood, and MacMillan (Hon. Secretary).

Horse Breeding.—Mr. Gardner initiated a discussion on the breeding and management of horses. He strongly favoured the heavy draught horse for farm work, with which most members agreed, but they thought that on small farms horses of a light stamp were better, as they were more generally useful.

Morgan, November 8.

Present—Messrs. Windebank (chair), Hahn, Wohling, Haupt, Pope, Plummer (Hon. Secretary), and one visitor.

Onions.—Members had noticed report of yield of 30 tons onions per acre on reclaimed land, and would like to know the character of the soil on which such a crop was grown. The Hon. Secretary stated that in planting care must be taken not to set the onion plants too deep, or good bulbs will not be obtained. Mr. Haupt used cow manure worked up fine and put in with the plants; this gave good results. It was necessary to keep the surface soil loose.

Drought Resisting Plants.—Mr. Pope read a paper dealing with this subject. He had been trying various hardy grasses, but without success, and was of opinion that any plant to succeed in their drought-stricken areas must have exceptional powers of absorbing moisture from the air or be very deep rooting. He had occasion recently to sink some holes about six feet deep, and found the soil at that depth quite moist, notwithstanding that they had experienced eight successive dry years. At Mount Mary the horses keep in better condition than round Morgan, and he believed it due entirely to the saltbush around the former place. About Morgan it had been killed out by sheep, and until they got a good season they were not likely to get it to grow again. The native lucerne of Algeria, referred to in the October issue of The Journal of Agriculture, might do, and perhaps the Department would secure some seed. The thornless opuntia, a variety of the so-called prickly pear, was worth trying, as it was hardy and made good feed. Mr. Haupt stated that he cut up plants of cockspur in a paddock; these were blown into heaps along the fences, and when quite dry the cattle ate them all. He saw plants of the "old man" saltbush at Roseworthy, where it was doing well. Mr. Wohling found his horses did well on saltbush so far as appearances went, but they would not stand working without some other food.

Booleroo Centre, November 11.

Present—Messrs. Nottle (chair), Steven Clack, Murdoch, Repper, W. and J. Michael, Brooks, Parsons, Albinus, Miller, McMartin (Hon. Secretary), and three visitors.

Wheat Experiments.—The Chairman and Mr. Clack reported unfavourably on World's Wonder and World's Champion wheats received from the Bureau. They were not suitable to the district and were liable to rust.

Sheep on Farm.—Mr. Nottle read a paper on the management of sheep on farms:—

He was one of the first farmers in the district to keep sheep, and had had considerable experience previously. He was convinced that sheep were most profitable on the farm; they were not very much trouble, nor was there much expense involved, but they brought in good returns and helped to keep the weeds down. In the stubble paddock they did good, trampling down and breaking the straw, making it better for ploughing under. Sheep were often more profitable than cattle; a farmer may keep 10 to 15 head of cattle and not net £1 a piece per annum. The same land would keep 100 ewes, which should with proper treatment return £41 10/, made up as follows:—7 lb. wool each at 6d. per lb., £17 10/; 80 lambs at 6/, £24. Sheep will do well on land that will not keep horses and cattle in condition. Good fences and small paddocks were necessary to profitable sheep keeping. A change from one paddock to another was beneficial even if the feed were no better. The best sheep for this district were the merino. The bigger sheep do not thrive so well when feed is scarce, and the wool being more open gets dirtier; they do not cut so much wool nor does the wool realise as much as the merino. Over stocking must be avoided, and the ewes culled every year to secure the most profit. Get a good ram; do not be afraid to pay a little more for a real good animal. Buy him in the wool so that you can see what he will carry. A ram well kept should cut 16 lb. to 20 lb. of wool. Many rams used by farmers will not cut more than 9 lb. to 11 lb.; this must certainly result in a low return from the flock. It was better to buy than to hire a ram as breeders did not usually hire out their best animals. Considerable judgment must be exercised in putting the rams with the ewes. If there is early feed, early lambs are most profitable, but it is poor policy to have the ewes dropping their lambs as they come to water. Often the lambs are left in the paddock when the ewes come to water, or the lambs will remain round the dam or well. A late lamb well fed is better than as early lamb badly fed, as if once checked in their growth they take a long time to get over it. Lambs should be tailed at seven weeks old; some stations cut the tail too short. This was quite unnecessary and cruel; if two to three inches of tail is left, the lambs keep cleaner and look better. After lambing the barren ewes should be put in good feed and sold to the butcher as soon as fit, as they generally fetch a good price in June and July. Farmers need to be very careful in respect to the lamb trade. The price of lambs was a strong temptation to sell the best, and those not fit will be kept for breeding. It was not profitable to keep sheep after they are 5 or 6 years old; young sheep do better and cut more wool.

Mr. Clack agreed generally with the Chairman. Mr. Brooks referred to the difficulty as to the number of stock to be kept; in some seasons he could better keep 1,500 sheep than 50 at other times. Mr. Michael thought that if he could get a profit of £41 from 100 ewes they would pay handsomely. He was convinced sheep paid the farmer directly and indirectly.

Maitland, November 1.

Present—Messrs. Bowman (chair), Tossell, Kelly, Bawden, Moody, Heinrich, Treasure, Lamshed, and Bowey (Hon. Secretary).

Wheat Experiments.—Meeting was held at residence of Mr. T. Bowman for the purpose of inspecting wheat crops grown from seed received from the Bureau. From a small quantity of seed received about three years ago, Mr. Bowman has increased the product until this year he has 100 acres sown with four kinds, viz., Marshall's Hybrid, Silver King, Ranjit, and Majestic. All the wheats look very promising, the yield being estimated at five bags per acre over the whole field. Mr. Bowman will give members and others the opportunity of securing seed of any of those varieties for next year's sowing. A hearty vote of thanks was accorded to Mr. Bowman for his work.

Honorary Members.—Mr. Tossell intimated that at next meeting he proposed to bring forward the advisableness of establishing an honorary membership in connection with the Branch.

Yorketown, November 8.

Present—Messrs. Lloyd (chair), Koth, Latty, Correll, Domaschenz, Anderson, and Newbold (Hon. Secretary).

Caterpillar Pest.—The Chairman tabled specimen of caterpillar found in large numbers on plants of the wild mustard. Members did not think there was much fear of the caterpillar attacking the wheat plant now.

"Drybible."—Mr. Correll reported having found the following treatment very successful for cattle affected by "drybible" or impaction. Mix ¾ pint of vacuum oil with quarter of a pint of kerosine, and give two or three times daily.

Peach Aphis.—In reply to question Mr. Domaschenz stated that a decoction made by boiling one stick of ordinary tobacco and one oz. soap in a gallon of water was an effective remedy for peach aphis.

Kapunda, November 1.

Present—Messrs. Shannon (chair), Teagle, Pascoe, Pat Kerin, Peter Kerin, O'Dea, Flavel, Morris, Holthouse, Weckert, Banyer, O'Sullivan, Correll, and Harris (Hon. Secretary).

Pig Breeding.—Mr. H. A. Holthouse read a paper on this subject—

> On every farm there is a certain amount of waste which could be turned to profitable account by feeding to pigs. On skimmed milk, with a judicious amount of grain or meal, young pigs will grow rapidly, but no more pigs should be kept than can be well fed. The improved Berkshire was probably the best all-round breed for the farmer. Care should be taken in purchasing the boar to get one from a reliable breeder. For bacon or hams the pure Berkshire and Essex pigs were most suitable, but for the butcher the progeny of crossbred sows would probably pay best. The sow should be strong, healthy, of large size, and a good mother. She should not be too fat, but have liberal exercise and plenty of food, as she will need all her condition to raise a good litter of pigs. For two or three weeks before farrowing keep the sows at night in separate pens, but allow them to run during the day. Always feed in the pens at night. A rail 8 or 10 in. from the sides and 6 in. above the floor of the pen will prevent the young pigs being crushed by the sow. A good supply of soft straw should be provided, especially in cold weather, and any that is wet or dirty should be removed while the sow is out of the pen. Give the sow all the milk or slops she will drink, but feed little or no grain for the first week after farrowing. If the food can be warmed it will be all the better. Afterwards the sow should get richer food; boiled barley or wheat is excellent, and care should be taken to vary the food as much as possible. The better the sow is fed the quicker the young pigs will grow. After weaning at about eight weeks' old, the young pigs will be treated according to what they are intended for. To make the most of the pigs, feed for the next 12 weeks on boiled corn, vegetables, bran and pollard, giving two feeds a day. Not more than six should be kept in each sty, and plenty of bedding should be provided. Without liberal feeding it is impossible to get the pigs to mature rapidly. A little neglect in regular feeding, harsh treatment, or damp, dirty pens will counteract the benefit of months of good management. In a certain sense the pig is a mill; provide it with good food and it will turn out good bacon. On most farms a patch of ground can be selected on which pumpkins, mangolds, or sugar beet will grow to perfection, and these pulped or sliced, and mixed with a little corn or meal, make a splendid feed for pigs.

Mr. Flavel said while a dry bed was necessary too much straw in the pen was dangerous, as the young are apt to be crushed by the sow. Mr. Correll advocated well bred pigs, as they were more profitable than ordinary mongrel animals. Mr. Teagle always kept Cheshire pigs, as he found that when provided with good bedding and shelter, and plenty of food they did better than any other pig. The Chairman had tried various breeds, and had fallen back on the Berkshire. He found the rail in the pen very useful to prevent the young being crushed. For market he found the purebred pigs paid best.

Davenport, November 6.

Present—Messrs. Trembath (chair), Hodshon, Brown, Tottman, Roberts, Pybus, Tickle, Lecky (Hon Secretary), and one visitor.

Annual Report.—The Chairman reviewed the work done by the Branch during the past year. He referred also to the changes that had taken place in the Bureau organization, and expressed the satisfaction generally felt by members that the Bureau system was not to be interfered with. The Bureau was a splendid organization, and it rested with the members individually as to whether the results of their work justified their existence. The work of this Branch had on the whole shown to advantage, when compared with previous years. Eleven meetings had been held, with an average attendance of over eight members. Ten papers had been read and discussed and they were greatly indebted to the local press for the prominence given to their work. Mr. Trembath was re-elected Chairman and Mr. Pybus elected Hon. Secretary for ensuing year.

Irregular Hatching of Eggs.—Mr. E. H. K. Messenger wrote in reference to failure in hatching eggs during the past season. Out of 176 eggs set, some under hens, others with turkeys, and some in the incubator, he only got 40 chicks. There were six different breeds of fowls, but the results right through were unsatisfactory; the unusual thing was that fully 80 per cent. of the eggs were fertile, the dead chicks in the shells being in all stages, some having actually chipped the shell and failed to clear themselves. Mr. Tottman said his experience was similar; out of 29 eggs in an incubator, 22 chicks chipped the shell, but died. These were local eggs; those he got from the other side of the range were more satisfactory. Mr. Pybus had satisfactory rsults from nests on the ground in the garden; several members also had satisfactory hatching, while others had very poor results. Members would like to know whether the unsatisfactory returns were due to any particular cause. [Mr. Laurie states it is impossible to suggest any reason without full knowledge of the stock birds, and of the exact treatment of the eggs in each case during incubation.—Ed.]

Whyte-Yarcowie, November 15

Present—Messrs. Hack (chair), Hatherly, Dowd, Faul, Mudge, Hunt, and Boerke (Hon. Secretary).

Thornless Opuntia.—It was decided to obtain some plants of the thornless opuntia or Indian fig with a view to testing its qualities as a drought resisting fodder plant.

Manures.—Mr. Mudge reported on experiment with manure for wheat crop on land about six miles south of Terowie. Smart's Early wheat was sown at the rate of 50 lb. per acre, one plot also getting 40 lb. super per acre. The wheat on the manured plot was about 2 ft. 6 in. high, and should yield quite 5 bushels per acre, while on the unmanured land it was only 18 in. high, and he would not get more than 2 bushels per acre. The manure cost 1/8½, and the extra labour 1/3½, or 3/ per acre in all. The value of the wheat on the manured land was 22/6 per acre, and on the unmanured 9/, showing a profit of 10/6 over the cost of the manure. Further experiments are to be undertaken next year. Discussion took place on the depth to sow wheat, and from experiments made during the past year members concluded that it was a mistake to sow with the drill deeper than 2 in. Owing to the lack of moisture much of the deep sown grains failed to come up, while the best returns will be from wheat that was barely covered; the latter promised to yield 9 bushels per acre, while the deeper sown is not likely to give more than 5 bushels. Bunt was reported to be prevalent where the seed was pickled with bluestone at the rate of 1 lb. to the bag of wheat.

Locusts.—These are rather numerous in the district, but not to such an extent as in two previous seasons. Members were of opinion that the only thing that would get rid of them was early rains in the autumn, as the eggs would hatch with the warmth and moisture and the young locusts would succumb during the winter.

Balaklava, November 8.

Present—Messrs. Manley (chair), Anderson, Reid, Robinson, Hams, Thomas, and Sage (Hon. Secretary).

Wheat Experiments.—Members met at Mr. Robinson's farm to inspect results of experiments with rust-resistant wheats supplied by the Department. There being no rust present in the crops, the main object of the experiment was defeated. Allora Spring was going down and shaking badly; Wiltunga Wonder was also going down but holding its grain; members were favourably impressed with this wheat. Budd's Rust-resistant was standing up well, and holding its grain. Karraf was considered by Mr. Robinson to be the best of the lot. Petatz Surprise was going down, but holding its grain. Members were surprised at the yields credited to this variety as the heads were very small and thin. Gluyas was going down so badly that members did not think it would be possible to get all the grain. Field Marshall looked well, and was rather flinty in the grain. Gamma appeared a good variety, but was not ripe enough to judge as to whether it will shake. Mr. Robinson stated that none of them seemed good enough to replace the best of those he had at present.

Pyap, November 12.

Present—Messrs. Rogers (chair), Napier, Billett, Robinson, Mills, Holt, and Cox (Hon. Secretary).

Apricot Buds Falling.—Mr. Robinson stated that the apricot trees were shedding the buds freely again this year. Members thought this was due to the dry winter and late irrigation. Watering in July in dry seasons was favoured.

Dairying.—Mr. Holt read extract on milking cows, the necessity for regularity and cleanliness in milking being insisted on. Members generally advocated washing the udder prior to milking, and condemned the practice of moistening the fingers in the milk. Mr. Napier read extract from the Journal on Dairy Cows.

Port Elliot, November 15.

Present—Messrs. Hutchinson (chair), Nosworthy, W. E. and W. W. Hargreaves, Green, Pannel, and Brown (Hon. Secretary).

Homestead Meeting.—Members met at the Hon. Secretary's residence, and inspected the crops, &c. A very fine crop of wheat was seen on land that had previously carried peas, both crops being manured. Another field on which several different manures were used for experimental purposes carried a very poor crop, being put in too late, and the rainfall being fully 5 in. below the average. Members reported that the hot winds had done a lot of damage to the pea crops.

Hon. Secretary.—Mr. Brown tendered his resignation as Secretary, and Mr. W. W. Hargreaves was appointed to fill the position.

Burra, November 14.

Present—Messrs. Goodridge (chair), Arnold, Dawson, Harvey (Hon. Secretary), and one visitor.

Oats on the Farm.—Mr. F. G. Dawson read a paper on this subject—

There was a considerable area of land in this neighbourhood suitable for the production of oats, yet very little except the wild variety are grown. Some oats might and should be grown on most farms where they are never tried. He had been growing oats in this locality for six or seven years, and it was worth mentioning that in spite of the fact that most of the time the seasons had been drier than the average, oats had invariably yielded better than wheat On every occasion they paid better than wheat under similar conditions. The oats were grown chiefly on heavy red land with stiff clay subsoil; they seem to require more moisture than wheat, and many of the flats in the district would undoubtedly produce good crops. There were, however, two great drawbacks to extensive oatgrowing. The first was the liability to shake soon after ripening, and the second the possibility of failing to get a market for large quantities. For these reasons he did not advise growing large areas of oats, but they were worth growing on every farm where conditions were suitable, as the grain is splendid feed for all classes of stock. Stout white oats in moderation were good winter feed for pigs and poultry. Horses will stand harder work on oaten hay than on wheaten, and will consume less; in fact, he considered 2 tons of good oaten hay equal in value to 3 tons of wheaten hay. It was a great mistake to cut the oats too green, as the hay will be somewhat bitter. They should be left until they are turning yellow; their feeding value is then very high, as there will be a great weight of grain in the hay. If the crop is stripped the straw should be mowed and gathered, as it is of good feeding value; even in the straw there will be a fair amount of grain, as it rarely strips as clean as wheat. As soon as possible after harvest the scarifier should be worked over the land, as, even harvested early, there is usually plenty of seed for another crop left on the ground. By this means splendid feed for stock can be obtained next season. If the land is free from weeds it is possible to get a good second crop of oats from one seeding. Many people were under the impression that growing oats spoilt the land for wheat, but that was not the case with white oats, as by leaving it out of cultivation for a year it can be cleaned, as stock are very fond of oats, and will prevent any plants seeding.

Kanmantoo, November 13.

Present—Messrs. T. Hair (chair), Lewis, Lehmann, Mills, F. Hair, and Downing (Hon. Secretary).

Farm Horses.—Mr. Lewis initiated a discussion on breeding horses. He condemned the proposed licensing of stallions as useless and unfair to horse owners. He considered the Cleveland a good useful type to breed for farm work. To get a good active horse with plenty of strength he would mate a fine blood mare wth an active draught stallion. For a lighter horse he would make the reverse cross. Much discussion took place as to the most useful horse for the farm. Some favoured the draught, others a medium heavy animal as being more generally useful. Members agreed that the most hardy and durable animals were those with a strain of pony blood.

Wheat Experiments.—Mr. Lehmann spoke favourably of Ranjit wheat, it matured early, and did not seem susceptible to rust. Silver King appeared quite resistant of rust.

Harvesting Wheat.—Discussion took place on threshing sheaved wheat, the header being generally condemned.

One Tree Hill, November 14.

Present—Messrs. Ifould (chair), Bowman, Hogarth, Smith, and Clucas (Hon. Secretary).

Summer Feed.—Discussion took place on the difficulty of growing green feed during the summer. Lucerne was favoured where it will grow; it should not be eaten off, but cut when young, as it will make a stronger plant. Cultivating the crop with narrow tined scarifier was recommended.

Season.—Owing to the drought this is probably the worst season for 30 years. Black rust has reduced the crops in some cases to the extent of one-third to one half. It attacks the crop in patches, showing on the leaves when the plant is coming into ear. Throughout the district crops will be light, but in the hills they will benefit from the late rains.

Poultry.—Discussion on this subject took place. The first cross between the Minorca and Leghorn was highly favoured by members.

Holder, November 15.

Present—Messrs. Rowe (chair), Blizard, Pickering, Vaughan, Jaeschke, Rossiter, Odgers (Hon. Secretary), and one visitor.

Grading Dried Fruits.—The Hon. Secretary furnished report on question of securing a stemmer and grader, and on the grading of fruit generally. It was decided to call a public meeting to place the information before the growers generally.

Richman's Creek, November 11.

Present—Messrs. Freebairn (chair), Knauerhase, Searl, Lehmann, Mattner, McSkimming, Roberts, and McColl (Hon. Secretary).

Destruction of Locusts.—Mr. Lehmann did not see why steps should not be taken to destroy locusts here, the same as was done in other countries. He thought a revolving drum with leather beaters would be found an effective means of destroying the young wingless hoppers. The drum could be drawn by a horse and the beaters would destroy the hoppers. He had this year noticed a large insect, like a wasp, killing and burying numbers of the locusts. Mr. Knauerhase thought if all would do their share they could very materially reduce the damage, but the expense might be heavy. The travelling stock road was the worst breeding ground in the district, and should be cut up and leased. Other members agreed.

Cherry Gardens, November 11.

Present—Messrs. Burpee (chair), Jacobs, C. and J. Lewis, Partridge, Brumby, Broadbent, Woods, and Ricks (Hon. Secretary).

Pests.—Mr. Jacobs reported that red spider was doing a lot of harm to potatoes and other green crops. The lucerne springtail was also doing serious damage to the crops. Members reported that the hot weather was causing the potatoes to wither, and the crops generally were patchy.

Mundoora, November 14.

Present—Messrs. Beck (chair), Owens, Aitchison, Mildred, Angley, Mitchell, Allen, and Gardiner (Hon. Secretary).

Season.—The Secretary reported that the rainfall recorded at Mundoora for the eight months ending October 31, was only 4.14. Mr. Angley tabled sample of bearded wheat which had made good growth, considering the season. Discussion took place as to whether the super put into the ground with the seed would remain available for next year's crop, many of the paddocks being as bare of growth as fallow land. Members could see no reason why the next crop should not get the benefit of the manure, but would like the opinion of those with more experience. [Judging from the effects of manure on the grass after a wheat crop, the manure applied this year should, where the crops have failed, be of benefit to next year's crop. This point is of considerable interest, and the Department hopes to be able to carry out some tests next season.—Ed.]

Smut in Oats.—Mr. Allen reported that oats sown unpickled had produced a crop badly infested with smut. The Hon. Secretary had the same experience with unpickled seed. Mr. Aitchison found pickling with 4 oz. of bluestone to the bushel of seed a sure preventive.

Cultivation of Olives, &c.—The Hon. Secretary asked whether it would not be possible to grow small areas of olives, date palms, or other fruits in the district which would afford some return in a season like the present. Members did not know whether the rainfall would be sufficient. [Unless there is sufficient moisture in the soil to mature the wheat crop, it is not likely that such trees would produce profitable crops. It is also doubtful whether palms would fruit at all here, and as to olives the cost of gathering and carting a long distance to market would swallow up the return. Almonds, and carobs, were more likely to pay in this district, but they would require cultivation and attention every year. Not much in the way of crop could, however, be expected with only 4½ in. of rain, unless water for irrigation was available.—Ed.]

Fowls Moulting.—Mr. Beck stated that his fowls were all moulting. Members were unable to account for this out-of-season performance, unless the fact that the fowls were very early hatched chickens. Mr. Beck stated that he found the use of sheep dip a good remedy for vermin. [It is impossible to say why the fowls should be moulting now, although careful examination of the birds and their surroundings might indicate a cause. Mr. D. F. Laurie says the best thing to do is to give a little sulphate of iron in the water and change the food if possible.—Ed.]

Quorn, November 15.

Present—Messrs. Thompson (chair), Rowe, Herde, Cook, Toll, Patten, Altmann, Noll (Hon. Secretary), and one visitor.

F.A.Q. Standard.—This subject was well discussed, and a resolution carried endorsing the motion passed at Congress urging the Chamber of Commerce to fix the standard at the earliest opportunity.

Rail Carriage of Chaff.—Considerable discussion took place on the arrangement by the Railway Department for the carriage of feed at reduced rates to the drought stricken districts; and it was resolved that in the opinion of the members the concession should apply to all chaff, irrespective of whether purchased by the farmer or by the merchant.

Mylor, November 15.

Present—Messrs. Neilsen (chair), Hughes, Probert, Nicholls, Narroway, E. J. and T. G. Oinn, Clough (Hon. Secretary), and two visitors.

Pruning and Manuring Fruit Trees.—Some discussion on these matters took place. Mr. T. Oinn advocated applying bonedust or stable manure well dug in about 2 ft. from the stem of young trees. Each year he would apply bonedust early in the winter. Mr. Probert preferred well rotted cowdung for newly panted trees. Mr. Neilsen referring to the use of seaweed, stated that the stuff obtained on our beaches was quite different and inferior to the seaweed used in Europe, the latter having large fleshy leaves and being brown in colour. Mr. Oinn stated that he had a cherry tree which blossomed freely, but only set a few fruits, he thought this due to necessity for another variety of cherry to facilitate cross fertilisation. The Hon. Secretary thought a good dressing of potash would be effective. [Refer to page 33 of August, 1902, issue, —Ed.]

Millicent, November 6.

Present—Messrs. Stuckey (chair), Stewart, Warland, Campbell, Mutton, Oberlander, Hart, and Harris (Hon. Secretary).

Potatoes.—Mention was made of the fact that the first and second prize lots of potatoes at the local show were two varieties, Thiele and Gratia, introduced by the late Chairman of the Central Bureau.

Orchard Cultivation.—Article by Mr. E. F. McBain in October issue of Journal of Agriculture on cultivating under fruit trees was discussed. Messrs. Hart and Campbell had fixed an outrigger with wire stay to the ordinary and Southbend ploughs respectively, and found it worked satisfactorily. The Hon. Secretary reported favourably of the work done by the circular harrows in the orchard.

Rearing Calves.—Mr. Campbell contended that it did not pay to raise calves where milk is supplied to the factory, except to keep up the milking herd. The dairyman could keep an extra cow in place of every four calves, and would get better profit from the cow. Even when butter is made at home it would pay better to feed the milk to lambs or pigs than to calves. Mr. Davidson admitted that there was a good deal in Mr. Campbell's argument. A good cow should average three gallons daily for five months, and at present prices this represented £10, or with milk at 3d. per gallon £6. Messrs. Mutton and Harris thought it paid to raise calves on skimmed milk, but did not favour the use of whey. The Hon. Secretary used Clarke's calf feeders by which the calves got the milk in a more natural way, and did not become "poddy." If they scoured at all he gave them a little salt in the milk.

Wilmington, November 12.

Present—Messrs. Slee (chair), Broadbent, Lauterbach, A. and M. Bischof, McLeod, Schuppan, Noll, and Payne (Hon. Secretary).

Apprentices on the Farm.—Mr. Broadbent read Congress paper on this subject, and some notes of his own on the matter. A good discussion ensued, There was no difference of opinion on the main question of the systematic employment of youths on the farm on terms of service, fitting them to become capable employers of labour themselves later on. The payment suggested by Mr. Dall was considered insufficient; members thought the farmer should start the apprentice at 5/ per week and board, gradually increasing his wages until he received full rates. Members also thought that farmers should give their sons some interest in the farm; for instance, let them cultivate a few acres and have the proceeds for their own personal use. It was finally resolved that the scheme outlined by Mr. Dall at Congress was worthy of further consideration, especially in districts where farming is more profitable than in this neighbourhood.

Port Germein, November 8.

Present—Messrs. Stone (chair), Blesing, Holman, Thomas, Kingcome, Smith, Head, O'Loughlin, Hillam, Deer, and Steinthal (Hon. Secretary).

Manures.—Discussion took place on the use of commercial fertilisers for wheat, and it was generally agreed that in the districts of Barootta and Telowie the manured crops were better than those not manured.

Wheat Experiments.—Members reported on experiments with various wheats received from Yorke's Peninsula last season. Lovelock's Early was generally considered the best, it being apparently less susceptible to damage from spells of dry weather than the others, and was well adapted to the climatic conditions of this district.

Minlaton, November 15.

Present--Messrs. Brown (chair), Bennet, Honner, Magor, Correll, Newbold, Anderson, A. McKenzie, Martin, and J. McKenzie (Hon. Secretary).

Thunderstorms.--Mr. Magor asked whether members had noticed the absence of thunderstorms of late, and also whether the crops suffered thereby. Members all stated that thunderstorms in the summer were not so frequent as formerly, and some held that the clearing of the timber had something to do with this.

Black and Red Rusts.—In reply to question members said red rust might attack a crop, but if the weather was unsuitable its development would be checked, and the crop escape without any apparent injury. The Hon. Secretary had noticed rust in places, but did not think it was likely to do much damage. Members should carefully watch the effect of the rust and report later on. Mr. Newbold stated that some wheats seemed to be more liable to damage from black rust than others sown under exactly similar conditions.

Making Farm Life Attractive.—Paper read at September Meeting (page 250 October issue) by Mr. Vanstone came in for considerable criticism. Some members did not agree with the suggestion to give the boys and girls some share in the profits of the farm.

Saddleworth, November 21.

Present—Messrs. Frost (chair), Benger, Eckermann, Leeder, Neill, Plant, Scales, Waddy, Coleman (Hon. Secretary), and six visitors.

Annual Report.—The Hon. Secretary's report showed that during the year, meetings had been held each month with an average attendance of 10.5 members. The Chairman and Hon. Secretary were thanked, and re-elected. The Hon. Secretary reported on various matters of interest in connection with the Adelaide Show, and also on visit to Roseworthy College.

Homestead Meeting.—This meeting was held at the residence of the Hon. Secretary, particular interest being manifested in the experimental wheat plots. Many of the wheats being tried are special selections of Mr. Coleman's, others have been secured from New South Wales and elsewhere. An unnamed selection was considered the most promising. Field Marshall, Bobs, Plover, Jonathan, and Marshall's No. 3 were also very good. The crops generally looked well, and fully two tons of hay per acre was being cut in some of the paddocks, in fact the poorest crop was going 35 cwt. per acre. This was grown on fallow land that carried a crop of sorghum during the summer, and this is the first time that Mr. Coleman has got a smaller return from such land than from the crop after bare fallow. Some of the crops although promising good yields showed the effects of the recent hot winds. The pigs, which are Berkshire, and the dairy herd were also inspected. The latter are Jersey's or Jersey crosses, and yield very rich milk, some testing up to 6 per cent of butter fat. Mr. Coleman is a strong advocate of the Jersey strain, finding that they will do better on less food than the larger breeds. Various other matters of interest were inspected, the members and visitors being afterwards entertained by Mr. and Mrs. Coleman.

Boothby, October 29.

Present—Messrs. Whyte (chair), Chaplin, Henderson, Way, Turnbull (Hon. Secretary), and two visitors.

Rust Resistant Wheats.—The Hon. Secretary tabled eight samples of wheat grown from seed received from the Department of Agriculture. They were all well grown, with good heads, and quite free from rust. Gluyas and Baker's Early were considered the best, Smart's Early also being favoured.

West Coast Lands.—The Chairman stated that in his opinion any one selecting land in what is known as the North Blocks in the Port Lincoln district should also receive 200 acres of Koppio land to make a home on, and use as a standby in such seasons as the present. The North Block at present was devoid of grass and herbage, and there was no timber for fencing, which, however, could be found on Koppio.

Mount Compass, November 8.

Present—Messrs. Jacobs (chair), Slater, F. and H. McKinlay, Sweetman, Hutton, Gowling, Herring, Good, Peters, Cameron, C. S. and A. J. Hancock (Hon. Secretary), and one visitor.

Potatoes and Peas.—Discussion took place on the cultivation of these crops. Mr. Sweetman considered that hilling potatoes was the better method. In threshing peas he thought the ordinary land roller would prove effective. It was decided to carry out experiments with potatoes of different sizes to test whether cut or whole sets were best, and what size sets gave the best results.

Forest Range.—Delegates to the Hills Conference reported on their visit. They were greatly impressed with the character of the orchard land and the careful manner in which the cultivation was carried out. The trees generally were more dense than those grown in this district, due to the different methods of pruning. The district was well worthy of a visit by any fruitgrower.

Port Pirie, November 15.

Present—Messrs. Johns (chair), Jose, Hannan, Wright, Bell, Welch, Lawrie, Spain, Wilson (Hon. Secretary), and one visitor.

Northern Conference.—Members favoured holding the annual Conference at Gladstone next year.

Rainfall.—Mr. Hector forwarded table showing total rainfall for 10 months ending October 31 of only 8.48 in. Of this 2.19 in. fell during first quarter, 1.76 during the second quarter, 2.78 during the third quarter, and 1.75 in October.

Veterinary Teaching.—Discussion on suggestion of Hon. Secretary in reference to instruction in veterinary science was continued. Members admitted the necessity for more knowlege of veterinary science, but failed to see any way of overcoming the existing ignorance as far as the farmers themselves were concerned, as they had neither the facilities nor time for acquiring such knowledge. They also expressed surprise that there was no competent veterinary in the north, being of opinion that there was a good opening for such a man.

Treatment of Fallow Land.—Mr. Johns read a paper on this subject. He would plough about five inches deep—more or less according to the nature of the soil—and get the work done as soon as possible after seeding. Then get to work as quickly as possible, and with a scarifier or large cultivator work it nearly as deep as the plough has been. Each subsequent working should be shallower; the first say four inches, the second three inches, and the third about two inches. Of the various implements for cultivating, the best to break the soil with was a scarifier or large cultivator, and then fallow with scarifier or chisel pointed harrows. Good scarifier harrows are effective on clean loose ground. The Spring-tooth cultivators did not meet with his approval

In stubble land and where the soil is loose the disc implements were very effective. Members differed in their opinions of the Spring-tooth cultivators, some condemning them, while others considered them the best of all implements for the purpose, but thought they could be much improved by the addition of another row of teeth. It was generally agreed that rolling the fallow was not advisable, and that in dry seasons shallow worked fallow was best. This year crops were better on land fallowed by the scarifier than on land fallowed by ploughing.

Pests.—Discussion took place on the increase of both sparrows and starlings. Rabbits were stated to be decreasing.

Murray Bridge, November 14.

Present—Messrs. Edwards (chair), Jaensch, Kutzer, Stacker, Schubert, and Lehmann (Hon. Secretary).

Work of Branch.—Owing to poor attendance at meetings called during past two months, the Hon. Secretary brought forward the question of closing the Branch. The members appeared to take very litte interest in the work, and the reading of papers was left entirely to the Chairman and Hon. Secretary. A motion in favour of closing the Branch was lost, and it was decided to strike off the roll the names of six members who have failed to attend for several meetings. Some members pleaded that they were not capable of writing papers suitable for discussion at the Bureau meeting. [If this is the case why not make a few notes on papers written by members of other Branches. The papers read at Congress are well worth discussing at the Branch meetings. Ed.]

Mount Gambier, November 8.

Present—Messrs. Mitchell (chair), Clarke, D. Norman, sen., D. Norman, jun., Dyke, Edwards, Kennedy, Bodey, Barrows, Williams, Wilson, and Lewis (Hon. Secretary).

Licensing Stallions.—Considerable discussion took place on the Bill before Parliament providing for the licensing of stallions. The proposal to impose a licence fee irrespective of any veterinary examination was generally considered to be worse than useless. Some condemned any legislation dealing with the subject, while other members thought something should be done to get rid of the inferior horses which travelled the various districts. It was decided that the question be adjourned until next meeting to give members an opportunity of bringing forward suggestions for the improvement of the Bill introduced by Mr. Livingston.

Imported Stock.—Reference was made to the number of stock from the drought stricken areas of Victoria which were being grazed in the district. Stock Inspector Williams directed attention to the necessity for compliance with the regulations dealing with the importation of stock, and also to the necessity for cleaning sheep from lice and ticks.

Finniss, November 3.

Present—Messrs. Chibnall (chair), Heath, Henley, T. and S. Collett (Hon. Secretary).

Homestead Meeting.—This meeting was held at the residence of Mr. A. E. Henley. The various crops were inspected, and Mr. Henley promised to furnish report later on on result of his experiments with different manures. Mr. Chibnall gave a practical demonstration of the use of the divining rod for discovering water. Some discussion took place on the work of the branch, and it was resolved to endeavour to get additional members to join.

Eudunda, November 17.

Present—Messrs. Gosling (chair), Martin, Walker, Weil, Hucks, J. and E. Pfitzner, and Marshall (Hon. Secretary).

Experimental Work.—Discussion took place on proposal to establish an experimental plot for the cultivation of bluebush, saltbush, and other hardy fodder plants. It was decided to accept the offer of land within the railway fence as offered by the Department, and to take the necessary measures to carry out the experiment.

Drake and Barley Grass.—Considerable discussion took place on drake. Some of the members wished to know how it was that new land sown with clean seed only will in a few years produce a lot of drake. Mr. Walker had found that by fallowing and cultivating he was able to get rid of the drake in the crops. Most of the members thought that the increase of drake in the crops was due to the fact that being shorter than the wheat much of the drake was untouched by the stripper, and the seed was thus left to grow next year. Mr. Walker stated that one year he got half as much drake as wheat in his stripper, but the same land now was practically clean. In reply to question the Hon. Secretary expressed the opinion that land overrun with barley grass could be cleaned by ploughing it soon after the grass has started to grow.

Koolunga, November 13.

Present—Messrs. Butcher (chair), Shipway, Sandow, Palmer, Cooper, Atkinson, Lawry, Butterfield, Noack (Hon. Secretary), and two visitors.

Apprentices on the Farm.—Discussion took place on Mr. Dall's paper on this subject. The Chairman considered Mr. Dall's idea a very good one, and if carried out would prove of great benefit to many city lads. Several difficulties in the way were pointed out by members, such as the choice of suitable lads, and also of suitable farmers to apprentice them to.

Gumeracha, November 17.

Present—Messrs. Hanna (chair), Cornish, Kitto, Foote, Monfries, Bond, Norsworthy, and Martin (Hon. Secretary).

Cultivation of Wattles.—Mr. Kitto read a paper on this subject:—

The wattlegrowing industry was of considerable importance to South Australia, and gave employment to a large number of workers directly and indirectly. It is stated that one firm of tanners in Victoria had used 1.200 tons of bark in a year, and that the yearly consumption in that State was 17,000 tons, but great difficulty is experienced in securing supplies, and there has been a considerable falling off in the export of tanned hides as a consequence. South Australia exports considerable quantities of bark to England, but there is also a falling off here. [Total production of bark in South Australia is, however, on the increase, and exports only show a small decrease.—Ed.] He believed there was room for considerable expansion in the output of bark, and had been assured by a reliable authority that so long as we could produce bark at a reasonable price there was no fear of over production. On rough and poor land wattles should be more largely grown, and even on good grazing land about 40 trees to the acre will not hurtthe grass, but will return a fair amount of bark. The broadleaf or Golden Wattle (Acacia pycnantha) was the best to grow. The easiest way of getting a stand of wattles in localities where they grow naturally, is to cut scrub and other rubbish, and early in the autumn run a fire through it. The wattles will spring abundantly after the fire. Amongst timber and rocks the best way was to break a few furrows with scarifier, or plough, or the spring-tooth cultivator, the latter being best for rough ground. Then after preparing the seeds sow broadcast on these strips, taking care to sow thinly. To prepare the seeds put them in cold water and bring the water up to the boil; take them off the fire, and leave in the water for 24 hours, then sow them, or put in a bag and keep in a damp place until needed. In respect to yield he had taken ¾ cwt. of bark from eight wattles on a rod of ground, this was equal to 6 tons to the acre, which at £4 gave a return of £24 in six or seven years. Many of them had scores of acres of land that did not return £1 per acre per annum, and it should pay them to grow wattles on this land.

The bark should be stripped when it comes away best from the stem; this will be about October to December, according to locality. The bark is also richest in tannic acid at this time. Wattles that show signs of crack or blister at the base should be stripped, as if left the damage will only extend. The bark should be left in the sun to dry until it begins to curl; then tie it in bundles, which should be put in heaps in the shade, and covered with boughs until ready to go away. By care and attention in this direction the bark will dry a nice light colour, but if exposed too much it will be black and sunburnt. When tying have two leather straps, place the bark on them, keeping the large bark on the outside to bind the smaller pieces, and draw the bundle tight with the straps. Then tie with cord or binder twine. Bundles going 50 to the ton are most popular.

Appila-Yarrowie, November 14.

Present—Messrs. Keller (chair), Francis, Bottrall, Fox, Wilsdon, Daly, and Bauer (Hon. Secretary).

Droving Sheep.—Mr. Wilsdon read a short paper on this subject. He advised starting sheep fairly early in the morning, and if they will move let them draw along by themselves. If they can be got to feed they will travel quietly and steadily. Sometimes they go too fast; in this case it will be necessary to get ahead of them. He had driven sheep 18 or 20 miles a day in this way, keeping fifteen to twenty chains behind them nearly all the time. If sheep are driven there is always the danger that they will turn sulky and keep all in a heap. Drovers should be very careful not to frighten the animals. In hot weather keep the sheep in as narrow a line as possible, so that they get the benefit of the wind and do not suffer from want of air. It is as well to camp in the middle of the day when travelling sheep during hot weather. Ewes with lambs less than two months old cannot travel as far as other sheep. He had travelled ewes with young lambs without injury by spelling every four or five miles for a half an hour. Travelling sheep do surprisingly well owing to the change of food they get.

Kingston, November 8.

Present—Messrs. Pinches (chair), Fraser, Pinkerton, Threadgold, Barnett, Cooper, and Wight (Hon. Secretary).

Sheepweed.—Fallowing and cultivating was recommended to a member who complained that sheepweed was overrunning his crop.

Evening Primrose.—Members considered that evening primrose was a good fodder and should be encouraged in this district.

Cattle Complaint.—Discussion took place on Stock Inspector Dowdy's report on cause of dry bible, &c. Members thought that Mr. Dowdy was on the right track. Mr. Pinkerton has a cow which suffers from a swelling in the udder and passes blood with the milk; so far as he could find she had not suffered from any injury. [Mr. Valentine advises giving a mild aperient, and to bathe the udder daily with warm water after drawing off all the milk. If there is much blood in the milk rub in little beladonna ointment; if only small quantity use lard or vaseline.—Ed.] Mr. Cooper had a cow which dropped her cud whilst chewing. She was in good condition, and had been in milk for nearly 12 months. [Mr. Valentine says this is an indication of indigestion. If the cow is fat and not of much value as a milker it would, perhaps, be better to sell her to the butcher. The following treatment might be tried:—Mix a little bran with linseed meal, and pour sufficient boiling water over it to make thick tea. Ten to 20 drops of nux vomica should be given. Provide sulphate of iron and salt for the cow.—Ed.]

Cement Floors.—Mr. Wight, in reply to enquiry for waterproof dressing for cement floor of chaffhouse, gave the following recipes:—(a) Mix together 1 part red lead, 5 parts ground lime, and 5 parts sharp sand, with boiled oil. (b) Mix 1 part red lead, 5 of whiting, and 10 of sharp sand, with boiled oil. (c) 5 parts powdered glue, 4 of resin, and 3 of red ochre, mixed with a little water.

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of men registered and found employment by Government Departments and Private Employers from October 29 to November 29, 1902.

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths	57	215	340
Masons and bricklayers	4	—	2
Carpenters	3	1	5
Painters	1	4	4
Boilermakers and assistants	—	1	1
Blacksmiths and strikers	2	2	—
Fitters and turners..	4	1	—
Engine Drivers and Firemen	2	1	—
Brass finishers	1	—	1
Patternmaker	—	—	1
Coppersmith	1	—	—
Plumber and ironworker	1	—	—
Pipe jointers	—	—	5
Cook and sculleryman	1	—	1
Female attendant	—	—	1
Apprentices	7	3	—
Cleaners	1	—	—
Porters and junior porters	6	1	—
Rivet boys	3	—	—
Totals	94	229	361

December 1, 1902. A. Richardson, Bureau Clerk.

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DEPARTMENTAL NOTES AND WORK.

At the Annual Congress of the Agricultural Bureau held last September, the following resolution was carried:—"That for the convenience of farmers living at a distance from the railway station the time allowed for clearing fertilisers be extended from eight to 48 hours." This matter was brought under the notice of the Railways Commissioner, who reports that he cannot agree to make a rule of the character suggested, but the General Traffic Manager will continue to use his discretion in not charging demurrage or storage where sufficient evidence is given that the consignee had serious difficulty in moving his goods within the prescribed time. It rests, therefore, with the individual farmer to bring under the notice of the Traffic Manager any charge for demurrage which he thinks is not justified by circumstances.

The Department of Agriculture has just issued a Poultry Manual written by Mr. D. F. Laurie, the well-known authority on poultry. The bulletin deals concisely with the breeding, feeding, and general management of poultry, and treats at some length with the symptoms of the various diseases poultry suffer from, together with the best treatment for such complaints. The Poultry Manual can be purchased from the Department of Agriculture and from booksellers; the price charged is 6d. per copy, or 7d. if posted.

Professor Perkins spent the first fortnight in December in Victoria, making an enquiry into the position of the phylloxera question by special request of the South Australian Vinegrowers' Association. A full account of his investigations will be reproduced in our next issue. Vines appear to have made exceedingly poor growth in Victoria this season, but the show of fruit is good, and after the December rains the vintage should be a normal, if not a heavy one. The same complaints, in reference to the disposal of export wines, with which we have latterly been made familiar here, are prevalent in Victoria. The determined crusade against the London Depot has had its effects on local markets; were we to amalgamate with Victorian growers we could easily turn the tables on our opponents. It is probable that some such proposal would be favourably received in the sister State; we notice that the Rutherglen growers have already moved in this direction. In existing circumstances the proposal is worth consideration.

On December 1, Professor Perkins had the opportunity of visiting Messrs. H. W. Morphett & Co's Estate, Wood's Point, on the Murray. The estate includes a large area of the swamp land that characterizes the lower portion of the Murray. There is little doubt of the great fertility of this land, when aided by irrigation; and if there were the magnificent object lesson which Messrs. Morphett & Co. have laid out within a few miles of Murray Bridge should prove sufficient to disprove it. Thirty tons of onions to the acre, and five cuts of lucerne the first year averaging two tons of dried hay per acre and per cut, should be sufficient to amply demonstrate the value of these swamps. We propose giving a full account of this profitable work of reclamation in our next issue; there are thousands of acres of similar land that might be equally profitably utilized.

Many South Australians are interested in homing pigeons, and the stations on the Melbourne route are frequently utilized for testing the stamina of birds. The recent regulations adopted in Victoria with a view of checking the spread of tick in that State, rendered it obligatory for birds to be sent for inspection to Melbourne before being released. Local owners complained about these restrictions, and, acting on instructions from the Minister of Agriculture, Professor Perkins while in Melbourne interviewed the Victorian Minister of Agriculture on the subject, and obtained from him the assurance that birds might be released from any station providing they were accompanied by a certificate to the effect that they were free from tick. Arrangements are being made to have the birds examined by Mr. D. F. Laurie.

By proclamation dated December 17 the regulations dealing with the importation of plants into South Australia were repealed and new regulations substituted in lieu thereof. From the date in question living plants or portions thereof, unless sent by post, must enter by sea at Port Adelaide. All plants must be accompanied by a sworn declaration that they have not been grown within 50 yards of any grapevine, and that the nursery or garden in which they have been grown is free from phylloxera. Grapevines or portions thereof are totally prohibited. Any plants introduced in contravention of the regulations will be destroyed.

During the month the Horticultural Instructor to the Department (Mr. Quinn) has examined the papers in fruit culture in connection with the classes at the Agricultural School and the School of Mines and Industries at Adelaide. He has also inspected orchards at Unley Park, Goodwood Park, Belair, and Lockleys, and visited the test plots in connection with the spraying experiments for the destruction of codlin moth at Forest Range, Summertown, and Piccadilly.

During the month Inspector Brown has been employed attending to inspection work at Port Adelaide and Adelaide. In conjunction with other inspectors 5,027 cases of fruits, 13 packages of plants, and 2,454 packages of vegetables have been passed for export to New South Wales and Victoria. The Western Australian market has also taken many hundreds of cases of cherries and plums, but these are not inspected prior to export. Of the fruits exported cherries and apricots form the bulk, totalling nearly 3,000 cases. The others are made up of 15 different kinds of locally grown fruits, ranging from alpine strawberries to semi-tropical citrus fruits, showing the width of range in fruit production we possess. During the month 3,964 cases of fruits and 11 parcels of plants were imported, and 4 cases of plants, 87 secondhand fruit cases, and 368 cases of Italian lemons and oranges have been fumigated before admission. Although there is a good show of young fruits on our lemon trees, it is very evident, should the summer turn hot, we must look to outside sources for our lemons this season, as our own stocks are depleted. Of the imported fruits 3,214 cases—equivalent to 6,428 bushels—were bananas. Of these, 252 cases were re-exported to New South Wales, leaving 5,924 bushels for local consumption. These figures show how our consumers have acquired a taste for this fruit, and will use large quantities even when locally grown fruits of various kinds are abundant and fresh. Inspector Hart has passed 85 cases of apricots for export from Stirling North to Broken Hill between November 24 and December 17.

COUNCIL OF AGRICULTURE.

The usual monthly meeting of the Council of Agriculture was held in Adelaide on December 17, there being present—Mr. R. Caldwell (Chairman), Col. Rowell, Messrs. R. Marshall, A. M. Dawkins, B. Basedow, J. Miller, G. R. Laffer, J. W. Sandford. A. Molineux, F. Krichauff, J. Murray, A. D. Bruce, T. E. Yelland, and Professor Perkins.

Considerable time was spent in discussing proposed constitution of the Council, and a draft of same was adopted for submittal to the Hon. Minister of Agriculture.

Various matters in connection with the Agricultural College were dealt with. Professor Perkins reported that some of the improvements asked for by the Council were being undertaken.

The Railways Commissioner advised that he had no ventilated trucks available for the carriage of fruit and vegetables, and he could not at present undertake the construction of additional cars. On the motion of Mr. Laffer it was decided to bring under the notice of the Minister of Agriculture the urgent necessity for providing better facilities for this traffic, as considerable damage resulted from the present method of carrying fruit and vegetables in close trucks covered with tarpaulins.

On the recommendation of the Committee on Agriculture and Stock it was decided to send 2,000 circulars to branches of the Agricultural Bureau seeking information concerning the symptoms of cattle complaint known as staggers, cripples, impaction, &c., also for particulars of remedies tried, losses, &c.

Messrs. Laffer and Rowell reported on visit of inspection to Forest Range, where growers using arsenite of soda and lime for the codlin moth had injured their trees. Both agreed that, while it was not possible to say definitely why the solution was injurious to the trees, there was no question that if the solution was properly prepared and good lime used there would be little or no burning.

CORRESPONDENCE.

[In this column we propose to answer questions of general interest, and also to make selections from our official correspondence. Questions dealing with matters of interest mainly to the writer will be answered direct. Correspondence invited. Ed.]

LACTIC ACID IN WINE.

L.N.S.—Estimation of volatile acidity in a wine will not as a rule indicate the presence of lactic acid, excepting so far that it is generally accompanied by a certain amount of acetic acid. Lactic acid is not, properly speaking, volatile, though part of it may pass over with steam. It is usually developed in wines in conjunction with mannitic fermentation, and if you can find mannite you can take for granted the presence of lactic acid. Evaporate a little wine in a watchglass away from dust; if present the mannite will crystalize out in long needle-like crystals frequently arranged in the form of a star around a common centre.—(A.J.P.)

PRUNING MUSCATEL VINES.

F.S.W.—Gordo Blanco is essentially a spur-pruned vine, and my experience does not lead me to expect rod pruning to be beneficial. Usually defective setting of fruit is the cause of this question being put to me. Vigour of vegetation or want of care in the selection of the cuttings are the most frequent cause of non-setting of fruit. If you find you cannot leave enough buds on the ordinary bush spur pruned, try a horizontal cordon about 16 in. from the ground with spurs four to six inches apart to the number required. (A.J.P.)

CURCULIO BEETLES.

A.M. These are very numerous and destructive in many places this year. Spraying the trees attacked with a mixture of one ounce Paris green to 12 gallons of strong limewater, or with the arsenite of soda as recommended for codlin moth, will result in the beetles being poisoned. About ten years ago Sir Samuel Davenport found that a bandage of sheepskin round the stem of young olives was a very effective trap for the beetles. The strip of skin is tied firmly round the stem below the first branches, the wool being on the outside. In attempting to cross the beetles become entangled in the wool, and can be gathered and destroyed in the morning. Unless the bandages are attended to early many of the beetles will get free.

VERMIN ON ANIMALS.

J.A.S. For ticks on pigs, poultry, &c., louse, fleas, or other small vermin, probably the best insecticide is kerosine emulsion. Dissolve one pound common soap in a gallon of boiling water, and while boiling add it to two gallons of kerosine and churn violently until it emulsifies or thickens. For use dissolve one part of the emulsion in ten parts of warm water. Pigs and other animals can be sprayed with this, but small animals are most effectively treated by dipping them all but the eyes, mouth, &c. If fowls are dipped in this way twice a year, choosing a hot day and doing the work first thing in the morning they will keep surprisingly free from vermin, where other reasonable precautions are adopted. Pure kerosine is sometimes used for poultry and other animals, but it is injurious to the skin, and often causes considerable irritation.

VINE AND WINE NOTES.

By Arthur J. Perkins, Secretary for Agriculture.

In the "Revue de Viticulture," 20th October last, Mr. J. M. Guillon gives some figures in reference to the yield of vines planted at different distances apart. His figures, which are given below, show that within certain limits an increase in distance increases the individual yield of the plants. Thus:—

100 Folle Blanches at 3 ft. 4 in. yielded 158 lb. 6 oz.
100 Folle Blanches at 5 ft. yielded 202 lb. 6 oz.
100 Aramons at 3 ft. 4 in. yielded 316 lb. 13 oz.
100 Aramons at 5 ft. yielded 655 lb. 9 oz.

If, however, these results are referred to the area cultivated and carrying these plants results obtained are very different, the yield per acre is altogether in favour of the more closely planted vines. From this point of view the figures work out as follows:—

1 acre of Folle Blanche at 3 ft. 4 in. yielded 2 tons 15 cwt. 1 qr.
1 acre of Folle Blanche at 5 ft. yielded 1 ton 11 cwt. 1 qr.
1 acre of Aramon at 3 ft. 4 in. yielded 5 tons 10 cwt. 2 qr.
1 acre of Aramon at 5 ft. yielded 5 tons 1 cwt. 3 qr.

So far as we are concerned, such distances as 3 and 5 ft. are of course out of the question. Independently of the question of yield, we have to bear in mind the cost of production. It is quite possible to obtain heavy yields, leaving smaller margins of profit than lighter crops. In a paper which I read before Congress in 1896, I attempted to define what appeared to me the most suitable distances for our special conditions. Later experience has in no way caused me to alter my opinions on the subject. I then stated that no vines should be planted at distances that did not admit of tillage with two horses abreast, or of the passage of a dray or wagon. On such considerations I fixed upon 8 x 8, for non-trellised vines planted on the square, and

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9 x 9 for vines planted on the septuple system, as irreducible minima. At the time far greater distances were in favour—10 x 10, for instance, and even 12 x 12. Such distances appear to me exceedingly wasteful, involving loss of space and unnecessary reduction of yield. For trellised vines I advocated, and still advocate, 9 ft. between the rows, the distance between the vines varying with the variety grown, the soil, climate, and system of pruning adopted.

* * * * * *

The following figures concerning the exports of South Australian wines, spirits, and brandies for the first nine months of 1902 have been kindly supplied by the State Collector of Customs:—

Exported to	Wines. galls.	Spirits and Brandies. galls.
Victoria	20,407	3,625
New South Wales	43,726	11,642
Queensland	20,305	568
Western Australia	10,871	2,078
Tasmania	5,993	342
Northern Territory	397	5
Commonwealth	101,699	18,260
New Zealand	18,432	1,537
United Kingdom	542,046	1,186
Cape Colony	4	2
Hong Kong	6	—
Strait Settlements	246	—
China	6	—
Germany	637	—
Fiji	110	—
St. Helena	10	—
India	2,826	—
Philippine Islands	2	—
Ceylon	1,035	—
Java	3	—
Natal	4	—
Total other countries	565,367	2,725
Total exports to end of September	667,066	20,985

These figures tend to show that the export trade is in an exceedingly healthy state; during the first nine months of the year all previous totals for twelve months have been exceeded. Total exports of wines in 1901 attained to 595.853 gallons, against 667,066 for the first nine months in 1902; it is quite possible therefore that the total exports during the present year will exceed 800.000. If we admit 800.000 for local consumption, and 500,000 for brandy, spirit, &c., we shall soon be drawing on our reserves unless our vine area is made to expand rapidly in answer to the demands of the market.

In the December number of The Australian Vigneron there is published a letter from Mr. L. Frere, of Albury, in which somewhat ungenerous remarks are made concerning South Australian and Victorian wines and wine statistics. Mr. Frere proves, evidently to his own satisfaction, that South Australian and Victorian growers must be adulterators; and that South Australian wines are inferior to Victorian wines, and of course to those of New South Wales. Finally he ridicules my anticipations in respect to the future intercolonial trade in South Australian wines.

Personally, I cannot but regret that Mr. Frere should allow himself to follow such a line of argument; nor do I forget that after all he is but a unit, voicing opinions for which he alone is responsible. I have no doubt that New South Wales wines are as pure as those of any of the other States; from long personal experience I can guarantee the purity of South Australian wines, Mr. Frere's luminous disquisitions notwithstanding.

The question of quality as applied to the wines of the different States, is of more delicate nature; nor do I intend discussing it. I shall content myself with stating that it appears to me that South Australian wines are generally more suited to the requirements of the English market than the wines of the other States.

Finally, had Mr. Frere read the whole of my article on the future of the wine industry he would perhaps have refrained from ridiculing my anticipations. I contended—and still contend—that the opening of the interstate markets would gradually have the effect of raising the consumption of wine in the other States to the South Australian level; and that as neither in Victoria nor in New South Wales a large extension of area could be anticipated, the lion share of the new trade would fall to South Australia.

* * * * * *

The heavy rains with which this State was favoured during the course of December have had the effect of materially improving the prospects of the vintage. There can be little doubt at the present moment that the 1903 vintage will be an exceedingly heavy one. Let us not forget the work and precautions that these summer rains have rendered necessary. Every acre under vines in the State should be carefully and thoroughly scarified, so as to break up the surface crust and create fine tilth. Never in my recollection has a better opportunity arisen for working down sandy land during the summer months. Tillage given at the present moment will considerably extend the value of last month's heavy downpour.

For many years past we have not felt the effects of an invasion of oidium. Let us beware of it during the present season. The moist conditions that must prevail for some time to come are exceedingly favourable to the development of this disease. Every grower should be prepared to sulphur his vines should occasion arise. In this respect a few notes on sulphuring should not prove out of place. Choose sulphur ground to finest of powders; whenever possible mix it thoroughly with 50 per cent. of an inert dark coloured powder, such as soot; if not available apply pure sulphur. If the weather threatens to be unusually hot, sulphur in the morning only, for fear of scorching the berries. Distribute the sulphur evenly throughout the foliage, paying particular attention to the centre and shaded portions of the vine. Use sulphur bellows, or preferably knapsack blowers, specially made for the purpose. Bags are both wasteful and ineffective, besides being dangerous to the operator's eyesight. Examine the vines carefully from time to time, and on the first appearance of the disease sulphur without delay.

THE RINGING OR ANNULAR INCISION OF VINES.

By Arthur J. Perkins, Secretary for Agriculture.

This practice, which consists in removing a narrow ring of bark from the stem, branches, or even rods of vines, has latterly come into extensive use among South Australian currant growers. Many years' experiences have now taught us that the Zante is an exceedingly unreliable setter, and we have, in a sense, been forced to adopt a practice that has long prevailed in the Grecian Archipelago.

It is difficult at present to foretell what will be all the consequences of this innovation. So far it has undoubtedly resulted in an increase of fruit yield without very seriously interfering with the vigour of growth of the plants. It can hardly be expected that this will continue to be the case in the future, when the plants will have stood the weakening effects of several successive years' ringing. In the Grecian islands I am given to understand that the vines rarely yield more than 15 to 20 crops. The economic problem to be faced, therefore, is whether in that space of time the yields will be sufficiently remunerative to pay for the original capital outlay, with interest, and the ordinary working expenses, and still leave a sufficient margin of profit to the grower. This is a question that our limited experience will not at present permit us to settle definitely; but I have little doubt but that the future will enable us to answer it in the affirmative.

There is one point to which I would like to draw attention as, in my opinion, likely to be a necessary consequence of ringing the Zante. At present, according to soils, we plant Zantes at 20 to 30 ft. apart—nay, in Victoria I recently heard of 60 ft.—and then have to erect an exceedingly expensive trellis-work to support the luxuriant growth. Now, in my opinion, ringing will do away with all this, and much to our advantage. The cost of such a trellis-work generally exceeds £15 per acre, and we do not get the full benefit of it until several years' gradual extension has enabled neighbouring vines to touch one another. In Greece the vines are grown much closer, and in the ordinary gooseberry bush with rods, a practice to us almost incomprehensible before the advent of ringing. I anticipate that by ringing vines from their third year we shall be able to plant them 8 to 10 ft. apart, and utilize an ordinary low trellis for the support of the rods. In this manner, though the vines may be shorter lived, the initial cost of establishing the vineyard will be considerably less, and the period of production will be entered upon at an earlier date.

The credit of popularizing the use of ringing is certainly due to Mr. W. C. Grasby, who, on his return from Greece a few years back, preached the gospel of ringing for all it was worth. In the November 22nd issue of "The Garden and Field" he makes several remarks in respect to ringing, on which I should like to comment. He is certainly guarded in his statements, but he appears to believe that the seedless berry of the currant is the result of non-fertilization, whilst the occasional large berries, with seeds, found on all currant vines are the result of accidental cross-fertilization. He states that he has emasculated a bunch and covered it with tissue paper, and that if the berries set he will be convinced that his opinion is correct. Perhaps so; but he will have to convince others as well. One experiment of the kind will hardly be accepted as sufficient evidence against the established laws of vegetable physiology, to which, by the way, he appeals. I would not go so far as to say that his contention is untenable, but merely that in the present state of knowledge I know of no analogy that would lead to such a conclusion. Parthenogenesis in the animal kingdom would be an analogous case, but I know of no parallel in the vegetable kingdom. Until better informed and convinced by a series of well-conducted experiments I must continue to believe that, unlike a leaf or bud, the ovary of the Zante flower will not develop until the ovules have felt the influence of the pollen, and that the absence of seeds is simply due to abortion of the latter at a later stage. The development of occasional large berries with well-developed seeds I look upon as a throwing back to the stock from which the Zante must originally have sprung.

Curiously enough, M. Jurie, a French vinegrower, whilst conducting experiments in 1896 to prove that the large berries of the Zante were induced by accidental cross-fertilization, succeeded in proving the reverse. I published his results in "The Garden and Field" in November, 1896. In his case the bunch that had been enveloped in a bag, so as to render access of foreign pollen impossible, and was, therefore, self-fertilized, or, as Mr. Grasby would say, not fertilized at all, produced large berries with good seeds, whilst the artificially cross-fertilized bunches produced the normal small berries. M. Jurie's experiments, however, can be looked upon as no more conclusive, I am afraid, than Mr. Grasby's single bunch is likely to be.

The patient reader may well ask—What has all this got to do with ringing? But we are coming to the root of the matter. On this theory of non-fertilization Mr. Grasby seems inclined to hang much of the value of the practice of ringing. For example, although still very cautious on the subject, he does not feel inclined to think that ringing would be equally effective on varieties with seeds such as the Gordo Blanco, that are otherwise notoriously bad setters. There is no doubt in my mind as to the cause of the defective setting of the Gordos. Whenever they are artificially cross-fertilized they set fine, compact bunches. This is the experience of all who have carefully studied the question, and I have confirmed it by personal experiments on various occasions. Whether or not ringing would improve the setting of the fruit is a matter that could easily be determined by personal experiment. A priori, I should answer the question in the affirmative, because the general weakening of the plant induced by the practice must, in accordance with general experience, result in a heavier production of fruit. And here it may be remarked that the old theory, to which Mr. Grasby appears to have given his adherence, has long been abandoned by botanists. Ringbarking influences to no greater extent the nourishment of the roots than that of any other portion of the plant; the elaborated sap returns to the roots just as much through the wood vessels as through those of the bark. Ringbarking constitutes a severe surgical operation, having analogous effects on the plants to any other form of summer pruning, although in a form more accentuated. The whole plant—and not the root system in particular, nor to a special extent—is weakened, and the plant bears more abundantly.

At the beginning of this season I was anxious to test the effect of ringing on some notoriously bad setting Gordos in the Roseworthy College vineyard, and I am now in a position to give the results secured. I may state that I believe it is possible to form a fairer idea of the results of the experiment by counting the bunches after setting, and dividing them into well set and badly set bunches, than by taking the weight of the bunches at a later date, when many may have become damaged and many will have disappeared. The experiment in question was distributed over three different blocks, each of which will be discussed separately.

Block I. consisted of low gooseberry bush vines, more or less gnarled and irregular in the stem, as is their habit. These vines were exceedingly difficult to ring, and in many cases superior results would certainly have been obtained had the ringing been done in a more satisfactory manner. A few vines were treated on the main arms, and here the results were remarkably good. In order to test the value of topping a certain number of vines were topped simultaneously. All operations took place just as the flowers were opening. Results obtained may be given as follows:—

	Ringed.	Topped.	Untouched.
Number of vines	154	31	28
Number of well set bunches	987	83	21
Percentage of well set bunches	51.22	16.24	
Number of badly set bunches	940	428	
Percentage of badly set bunches	48.78	83.76	

We did not trouble to count the badly set bunches on the vines that were not treated, as, with the exception of 21, they were all bad. Such results, it appears to me, speak for themselves, especially when it is remembered that but few of these vines were ringed in a satisfactory manner.

Block II. consisted also of gooseberry bush vines, but with taller and more regular stems. In consequence the ringing was generally more perfect. Results are appended below:—

	Ringed.	Untouched.
Number of vines	22	2
Number of well set bunches	268	2
Percentage of well set bunches	78.59	4.35
Number of badly set bunches	73	22
Percentage of badly set bunches	21.41	95.65

Results here are in accordance with those of Block I., only in a more striking form.

Finally, Block III. consisted of Gordos trained on a spur-pruned cordon, with stems 3 ft. in height. Here, again, ringing improved the proportion of well set branches to a remarkable extent:—

	Ringed.	Untouched.
Number of vines	37	1
Number of well set bunches	354	3
Percentage of well set bunches	72.84	23.08
Number of badly set bunches	132	10
Percentage of badly set bunches	27.16	76.92

It would hardly be wise to draw conclusions from the experience of a single season. I believe, however, that we may safely admit that ringing appears effective so far as the setting of Gordos is concerned. Whether this practice is ever likely to be adopted widely for this variety is another question. I am inclined to doubt it, owing to difficulties that have already been referred to. It is wiser—and would probably prove more effective in the long run—to carefully select cuttings from vines known to be normally satisfactory bearers, and to gradually graft out those that are unsatisfactory.

In the "Revue de Viticulture," 20th November, I find another application of ringbarking which is likely to prove of immense value to vinegrowers in some countries. In time it may prove of use to us. I, therefore, make no apology for referring to it. Ever since the brandy and champagne districts of France have been invaded by the phylloxera, the great problem before vine-growers has been the discovery of a suitable resistant stock, well adapted to soft limestone soils. Of the numerous species of American vines Vitis Berlandieri alone presents all the requisite qualities. Unfortunately its cuttings do not strike root in a satisfactory manner, so that in most cases layering—a somewhat costly method—has been resorted to for rooted plants. Various attempts have also been made with hybrids of American and European vines, none of which, however, have proved altogether satisfactory. Accordingly French growers are likely to hail with joy the publication of M. Jachet's method, should later experiments prove equally successful. M. Jachet ring-barks the yearly shoots of vines immediately below a bud; there is abundant formation of callus and an appreciable swelling of the bud. In winter the shoots are severed immediately below the callus and planted out as cuttings in the nursery, where for three years in succession they have yielded about 80 per cent. of rooted plants, as against 5 per cent. with ordinary cuttings. M. Jachet states that similar results may be obtained with other vines and plants that under ordinary circumstances root their cuttings with difficulty.

FEEDING VALUES OF HAY, STRAW, AND "COCKY CHAFF."

The drought is a cruel master, but the lessons taught are sometimes of great value. In the mallee and northern districts, where the bulk of the crops is harvested by the stripper, it is quite the exception for straw to be saved, and even the "cocky chaff"—that is, the cavings from the winnower—is either allowed to rot in heaps, or is burned to get it out of the way; only occasionally is it considered worth saving. Where there is a large area under crop, as is the case on most mallee farms, the tracks cut for the stripper through the wheat fields provide a considerable quantity of hay, and a more than usually dirty patch of crop is cut for the same purpose. Thus, the average farm generally produces enough hay for the horses, and straw, or "cocky chaff," is not much valued. Yet they both have some feeding value, and are worth saving, as was shown by Mr. A. N. Pearson, late Government chemist for agriculture, when asked by The Australasian to determine the relative feeding values of "cocky chaff," wheaten straw, oaten straw, and prime oaten hay. The composition of these fodders, all calculated to the same amount of moisture, is on the average about as follows:—

	Total.						Digestible.		
	Moisture.	Ash.	Albuminoids.	Fibre.	Starch, Sugar, etc.	Fat.	Albuminoids.	Fibre, Starch, Sugar, etc.	Fat.
Wheat husks	14.3	9.2	4.3	36	34.6	1.4	1.4	33	.4
Wheat straw	14.3	6.3	4.6	35	38.5	1.4	1.2	34.5	.4
Oat straw	14.3	4	4	40	36	2	1.4	40	.6
Oat hay	14.3	6.1	8.4	26.5	42	2.6	4.8	41.5	1.2

The principal constituents to be considered are the digestible albuminoids, which are flesh-formers, and the digestible fibre, starch, sugar, &c., which are heat and fat producers; also the digestible fat, which is also a heat and fat producer, and has 2½ times the value of the digestible fibre, starch, sugar, &c. The above figures show that there is not much practical difference between wheat husks and wheat straw, that oat straw is 20 per cent, better in heat and fat producers than the other two, and that oat hay is about 25 per cent. better than the first two in heat and fat producers, and is nearly four times as rich in digestible flesh-formers.—Australasian.

ROSEWORTHY AGRICULTURAL COLLEGE NOTES.

FARM.

Harvest.—This week we hope to finish the threshing. This work would have been completed last week, had not the rain interfered, but, with careful attention and quick work on the part of the students they have seen how, by frequently turning the stooks, a thorough wetting such as the grain received from three days' rain, can be completely overcome in a short time. The crop has been very uneven, and the yields will be generally light.

The Water Supply.—The rain of the 16th could not have been better timed. We had already reached the limit of useful water from the dam, which was the only source for use in the boiler, the supply from the well was threatening to fail, by reason of continual use both at the stables and in the paddocks, and at the College building the laboratory tank was dry, and the domestic supply would have been exhausted in another day. A meter and service pipe have been attached to the Barossa system at Nottles, but no other work has as yet been begun at the College.

The rain was sufficient to permit of ploughing again, and there is every prospect now of finishing the fallow before it dries up again. The crops of maize and sorghum already show the influence of the recent rains, and now give promise of a fair crop for summer feed.

The Christmas holidays will begin on Wednesday, December 24, and continue until Monday, January 5. The session will then continue unbroken until the end of the vintage, which will probably be about the end of February.

Harvester Trial.—On Friday, November 28, nearly every student and a number of the staff attended the harvester trial at Smithfield, and on the following day James Martin & Co., of Gawler, sent one of their machines to the College Farm, operated it, and demonstrated its working parts to the students.

FARM HINTS FOR JANUARY.

By A. Molineux

Grass fires are to be dreaded, and every precaution should be adopted to prevent them spreading over large areas. Close feeding down around the boundaries of paddocks and adjacent to roads especially might be promoted by making the dry herbage attractive to the sheep and other animals. Probably spraying a solution of super., molasses, and salt would induce the animals to stick closely to the dry herbage, and this could be cheaply and easily applied with a liquid manure spreader or a street sprinkler, or with a Dobbie-Pearson broadcast sprayer. Even if the experiment were to fail, the application would not be altogether wasted, because the ensuing grass crop would get the benefit. The enormous losses that must inevitably follow the outbreak of extensive grass fires demands the adoption of every means to prevent their occurrence. Ploughing is slow, difficult, costly, and ineffective; burning off strips is wasteful and dangerous; mowing is almost impossible in most places; growing green feed as firebreaks is generally out of the question; but if the feed can be made especially attractive to the animals, they will make the firebreaks at a minimum of cost and there will be no waste of fodder, and an absence of danger to neighbouring paddocks.

Next to danger from fire is the possibility of damage from water when haystacks are left unthatched. Where galvanized iron can be used it will be cheapest in the long run, if proper care is taken of it when not actually in use. Stacks should be separated, to prevent fire spreading from one to another in case of accident, and a good wide space should be cleared of all rubbish around each stack.

Where it is possible, sow broadcast on short stubble land a mixture of two pounds each of rape and white mustard seed, and harrow or scarify it in. The first heavy autumn rains will cause all seeds to germinate, and within a very short time there will be a strong growth of green stuff that will be acceptable to the farm animals.

It is possible that maize and sorghum could be grown for green feed in any locality where irrigation can be applied. The seed should be sown in drills, and the soil kept well cultivated.

Maize is in its best condition as fodder when the corn begins to glaze or harden. It is most economical to chaff it, and it is advisable to put it down in a silo.

Leaves of beets, mangolds, cabbage, and other succulent green stuff will make excellent silage when placed in alternate layers with chaffed straw. About a foot depth of straw and 18 in. of green stuff will be most attractive to stock.

Fallowed land that has become caked and comparatively solid will lose much of the benefit that was sought in laying it up. It will dry soon to a great depth, most of the rain water will run away over the surface, the air will be excluded to a considerable extent, and the nitrifying agencies cannot be as active in a dry, hot soil as they could be in one that was moist, warm, and free to the admission of air.

Cabbage, kail, and other succulent green crops should be constantly cultivated to a depth of about three inches, and it will benefit them if liquid manure can be applied between the rows near the roots before each hoeing. Beets and mangolds should be singled, and any gaps in the rows may be filled up by transplanting if great care is taken to avoid injury to the tap roots, and to prevent doubling up of the root when planting. A small bed should have been sown to provide plants for filling up gaps, but failures in singling previously may afford sufficient for the purpose.

Pie melons and pumpkins may still be sown with a chance of a late crop. Dig in some very old manure in holes 20 ft. apart, and put at least a dozen seeds in each place. Soak the seeds 24 hours first, water the spots freely, and sow: when the plants come up reduce them to eight of the strongest, and when six leaves appear reduce to three of the strongest and best placed. Plant a little maize widely apart amongst the rows to prevent the wind shifting the runners, and avoid digging or cultivating anywhere within a radius that could be reached by the longest runners.

Many of our best grasses and herbs are annuals, and if the plants are not allowed to produce seeds there will be very few survivors next season. Fires and over-feeding are responsible for serious deterioration of pastures, because the coarse and useless plants are left to seed and cover the land, whilst the most useful plants are destroyed.

In good localities, or where water is available, potatoes may be planted in rows 30 in. apart, 1 ft. between the plants, and 4 to 6 in. deep, according to the nature of the soil—deepest in peaty soil. Do not hill the rows, but if some litter can be placed between the rows when the plants are 6 or 8 in. high, it will be good for the tubers. By hilling the rich soil is removed from the feeding points of the roots just at the time when food is most required for development of the tubers.

The best onions I ever grew were from seed sown in a rich, sandy loam in January, and planted out in May. Fowlyard manure is a good fertiliser for an onion crop.

Cart out and spread a good lot of manure on to an acre or two acres of land well situated near the home. At the first opportunity, plough that land deeply and break it down with scarifier, harrows, and roller. Then fence it securely against stock, and plant some fruit trees 30 ft. apart. Use the spaces between for a year or two for growing vegetables, but not closer than 5 ft. the first year and 10 ft. the next. Keep the surface loosened up constantly with a horsehoe, and maintain fertility with plenty of farmyard manure The results will well repay the small amount of labour, and the doctors' bills will not trouble much.

PLUMP *V.* SHRUNKEN WHEAT AS FOOD FOR LAYING HENS.

The question as to which is the better food for laying hens, shrunken or plump wheat, is one which has been agitating a number of poultrymen in this State, and to intelligently answer it, two samples of wheat received from Mr. MacFarlane, of Hanford, have been analysed with the following results, the figures indicating per cent.:—

	Shrunken.	Plump
Moisture	8.30	9.80
Ash	2.34	2.00
Fibre	3.48	2.05
Starch, &c.	66.78	72.65
Fat	2.00	1.80
Protein	17.10	11.70
Total	100.00	100.00
Fuel value in 1 ℔. (calories)	1,709	1,683

Poultry rations are usually too carbonaceous, that is, they contain too much starchy matter and not enough of the albuminoids so necessary for egg production, consequently, the richer a food is in albuminoids the more valueable it is to the poultry feeder.

An examination of the above table shows two main differences in the results. In the plump wheat the percentage of starch, &c., is considerably higher than the corresponding figure for the shrunken wheat; while the reverse is noted for the rating of protein; that of the latter sample being almost 50 per cent. greater than that yielded by the former, as is seen by the figures 17.10 and 11.70 per cent, respectively. This fact alone is sufficient to warrant a feeder purchasing the shrunken in place of the plump wheat as a food for laying hens.

It is barely possible that the digestion coefficient for protein in the shrunken wheat may not be as high as that for the plump, but this question we will settle at the earliest opportunity by a digestion experiment with our hens. It must not be forgotten, however, that the figures 11.70 for albuminoids (protein) in the plump wheat is a trifle below the average; and while another examination of two similar wheats would in all probability show the shrunken sample richer in nitrogen, there might not be such a marked difference as we have between the two lots under discussion.—California Experiment Station.

POULTRY NOTES.

By D. F. Laurie

The action of the Victorian Government in prohibiting the importation of poultry from this State has caused a wave of energy towards destroying the poultry tick. The pigeon fanciers are also up in arms, and are indignant at the proposal to include pigeons as liable to introduce the pest. I have been assured by several reliable pigeon breeders that at no season of the year and under no circumstances does the popultry tick, as found in this State, ever attack pigeons. Valuable pigeons are now, and have been for some months, in a shed where it is stated no fowl can live. Cases are reported in which the tick seems to have quite deserted sheds at one time used for fowls but now in the occupation of pigeons. I have never known of pigeons being infected by any tick in this State. Exhaustive experiments should be made before it is assumed that any bird or animal is liable to attacks of any similar vermin. I shall be glad if any readers having pigeons will state their experience, and, if any tick are attacking the pigeons, to forward specimens for identification. It is worthy of note that the N.S.W. poultry breeders aver that the tick has been introduced into that State from Victoria, and say that the action, if any, should be on their initiative, not Victoria's. Tick can be exterminated, without doubt, and with moderate application. I can mention several very bad cases where this has been the case. In one instance the ticks appear to have died out, and it is a matter of regret that the case was not reported in time to make an examination as to the possibility of this being due to the action of a parasite or disease.

I have received a copy of the first part of Mr. Harrison Weir's new work, "Our Poultry," which is beautifully got up, and is full of the greatest interest to those who wish to master the subject of poultry breeding. The breeder o' to-day has to thank Mr. Weir for half a century's careful delineation of the birds of the day, so that we are able to note the alterations made during that period; and when we read any of his numerous articles, written concurrently, we are made more closely aware of the rise and fall of different breeds and the causes which have led to the present state of affairs. For many years a battle raged in the English poultry Press concerning the Langshan fowl, a breed with which Mr. Weir has always been closely identified, and the degeneration of which he never ceases bewailing. Only about thirty-two years ago this breed was introduced by the late Major Croad, and soon gained a firm footing as one of the most valuable of the utility breeds. The "faddist" fanciers and ignorant judges have done their best to ruin the breed, and we constantly see "storklike" birds, as unlike the original Langshan as can be. What benefit the fanciers expected from this type of bird I cannot divine: they may lay fairly, but they develop slowly, and are of no account for table—no longlegged birds are. With regard to legs we saw the same thing as regards modern English game, a breed whose length of leg may suit the fancier, but is worthless to the utility poultry breeder. The battle of the Langshan spread to this State, and I took a firm stand in the matter, and read an exhaustive paper on the question before the S.A. Poultry Society. This paper was afterwards published in several journals, and was also, by request, permitted to appear in Mr. Compton's poultry book. Since then several well-known Australian writers have taken the same stand, and endeavoured to stay the tide of degeneration, and it is to be hoped we shall retain this valuable breed. Mr. Weir, of course, makes reference in his new book to this valuable breed, and doubtless the chapter on Langshans will contain a summary of the many articles and letters written by him, Miss Croad, and the many lovers of the true breed. For some time fanciers were inclined to think Mr. Weir and others of his opinion conservative in the matter of breeds. Those disinterested people who have really studied the question have always seen the truth of Mr. Weir's contentions, and have agreed with him. Space does not admit of more than a passing reference; but it may be stated that this new book is very pleasant reading to me and those who have adopted my views, for therein they are strongly corroborated. Mr. Weir throws a strong light on the poultry as bred half a century and more ago—he, with others, blames the introduction of the Asiatics (with the exception of the Langshan, which is a more recent acquisition), for the deterioration of English poultry in general, as regards fowls. Considerable light is thrown on the subject of the Dorking fowl, and a coloured plate of the Old Red Dorking is given. I distinctly remember seeing this variety as a small boy, and for many years, when I only saw the coloured, silver grey, or white varieties, thought my memory was at fault. These red Dorkings came to, Victor Harbour on a wool ship, but, unfortunately, the breed was never kept intact, as was the case with a lot of Plymouth Rocks, given to my people by a ship's captain some years before they were known here. I shall endeavour to get some of these Old Red Dorkings from England at some future date, as without doubt they are one of the original colours of the breed, and probably the best of all. Writing of a visit to the country more than seventy years ago Mr. Weir says:—"The farmer and the poultry fancier of to-day have but little or no idea of the superior and long-tested quality of the then ancient breeds of fowls matured and kept about our southern homesteads, nor how much they were cared for, appreciated, and valued. Both cocks and hens were most carefully and thoughtfully selected, not only for their fineness of flesh, thinness of skin, their form and size, but also for their uniformity and beauty of colour. In this respect districts and farms were known as having a certain speciality, and the fowls were not, as many modern writers ignorantly state, unculled or unmatched. In many cases the housewives were as proud, if not more so, of their poultry as any cattle breeder was or could be of his cattle."

On more than one occasion I have descanted on the craze some people have for crossing, and have constantly deprecated this error, and sought to impress on readers the superior merits of carefully bred specimens of the pure breeds. I have further stated that to the poultry shows and the fanciers we owe the possession of our present pure breeds, despite the fact that the utility value of some has been impaired, and on this point Mr. Weir says:—"It must be clear to every observant mind that as the craze for mongrelizing is rampant and still gains credit with the credulous, that were it not for our poultry shows our tried, serviceable, in all ways valuable pure breeds would very soon cease to exist. These old fowls of ours, the work of ages, the perfection of table fowls, the abundant layers of good white eggs, the beautiful, the grand, the stately, well-formed, delicate fleshed, easily bred and fattened, unsurpassed, long cherished for all their profitable uses. I say emphatically were it not for the poultry shows, these, and the like of these, would be things of the past, and to the lasting disgrace of the poultryman of to-day they would become extinct."

Those who are still inclined to favour mongrels and all sorts of crossbreds will do well to weigh the following remarks coming from this accepted authority:—"Of this I am quite certain, and this from a long life's experience, that whatever animals or birds are kept the best, the handsomest, and the purest bred are not only the cheapest but in the end will be found the most gratifying as stock, and for the most enjoyable and profitable in every way."

In a future paper I shall give further extracts, which support my teachings, thus serving the double purpose of adding strength to my own contentions and also putting much information from this great source at the disposal of many who do not possess a copy of this work. Mr. Harrison Weir has judged at more shows than perhaps any other fancier of the present day, and is still in the front rank as a delineator of poultry, besides for many years he was the sole artist for "Poultry."

Readers will do well to refer to the advice in recent numbers on prevention of diseases and general management. The hot season of the year is always a trying one for poultry. Contaminated surface water, due in cases to the recent rains washing manure into hollows, is dangerous for poultry to drink. Cull out and dispose of all birds not up to standard: keep the space for the better class of bird.

Early in January the Department of Agriculture will issue the Poultry Manual written by myself. This has been written purposely for farmers and commercial poultry keepers, and, as the price is only 6d. a copy, it is within the reach of every one.

ORCHARD NOTES FOR JANUARY.

By Geo. Quinn, Horticultural Instructor.

If followed promptly with good surface cultivation, the copious rains of December should make amends for the deficiency of the winter's fall. Although arriving too late to benefit the earlier ripening kinds of fruits the mid and late season sorts should improve vastly. The prospects for next year should also be improved by causing a good growth of well-ripened wood and properly developed flower buds.

The main work of the orchard at present consists in gathering in the crops as they ripen. Up till now the season is proving a fair one. The strawberries were scarcer than usual, and cherries only moderately plentiful, the later ripening sorts being more fruitful.

The prospects of a good plum crop are pretty well assured, and the same may be said of apricots. Peaches will be up to the average in quantity, and should now show good quality. Pears are patchy and apples from fair to good in quantity, and the quality is promising. Some of the export kinds are showing well, and growers will act wisely in making their arrangements for export well beforehand, as Tasmanian and Victorian crops are capable of filling all the space available. As the season is advanced somewhat, it will be interesting to note whether the fusicladium will make much headway now.

As far as damaging the fruits is concerned, past experience assures us there is not much danger, but the humid atmosphere will favour its growth on the leaves.

One effect of the recent rains will be to delay the time for fracturing laterals upon pip fruits. In early localities the end of January proved a good time to do this work, but one must reckon with the extraordinary season this year. In recommending this practice to growers I wish it to be distinctly understood that only vigorous, densely growing trees that have not developed a fruitful habit should be operated upon. The leading growths which carry on the shape of the tree should not be pruned now, neither should the laterals which emerge on the outside and project away from the body of the tree. All the laterals in the centre of the tree, and those situated between the main arms should be fractured. The fracture is made by breaking the lateral nearly off, and allowing the end to hang by a small piece of fibre and the bark: two or more buds should be left on the stub below the fracture. The right time to apply the fracture is when the sap is receding and the tips of the shoots are pretty well ripened. It should not be inferred that the application of this practice will immediately result in the adoption of a fruitbearing habit by the tree. The object is to weaken certain parts, viz., the rank laterals, and when this condition is secured flower buds will develop upon them, and when the tree has settled into fruit production this green pruning is no longer required. In fact, as soon as a regular habit of fruitage is secured the gardener often finds it is necessary to begin to restimulate the growth of the trees by manuring or winter pruning. Thus throughout the lifetime of the trees we go on checking or stimulating just as it suits our purpose, viz., the production of regular crops of good fruit. In the case of peach trees planted in moist, rich soils it is necessary to apply green pruning at this period to keep the heads of the trees from becoming too crowded. With this object in view strong growths should be cut out of the centre completely, and if there be a greater number of leading shoots growing upon the main arms than there is room for they should be thinned out. I wish particularly to warn beginners against indiscriminately shortening back these strong shoots. Such pruning only results in multiplying their number and increasing the density of the foliage and twig growth. If the tops of the peachtrees are kept open so that abundance of light can penetrate between the branches and reach the laterals the flower buds will be formed lower down upon them. In such a case the rapid extension of the tree can be prevented without throwing away much fruiting wood.

The revived growth consequent upon the recent rains should put all stocks in suitable condition for the insertion of buds. The present is a good month to begin this work, but the most experienced workmen do not stimulate the buds into active growth at this period. This dormant condition is retained in the bud by allowing the top of the stock to remain uncut until the winter season. Growers should be very particular to select buds from trees known to be good bearers of fruit of first-rate quality, as the general characteristics of the parent tree will be reproduced.

In cases where the plants have not to be carried far, young citrus trees can be readily transplanted now, providing a ball of earth be retained upon the roots. A good soaking of water, a mulch upon the surface above the root system, and shelter from strong winds are essentials to the success of this work. If the roots are injured the tops should be reduced accordingly.

The present is a good time to destroy scale insects, more particularly the Red Scale, upon citrus trees. Before applying the spray all superfluous twigs should be cut out and burnt. The best spray washes tried locally for this purpose are Resin Compound and Kerosine Emulsion. These should not be applied to trees unless they have plenty of moisture in the soil about their roots. The reason why these insects are more readily reduced now is probably due to the presence of the crawling larvae in a naked condition, and to the loose, more or less tilted, position of the puparium of the mother scale, which permits the exit of the young ones from beneath.

Up to the present spraying with arsenite of soda and lime for the destruction of codlin moth is particularly promising where the work has been carried out systematically. Those who are growing late ripening sorts should spray again during this month, and if the fruits are likely to hang till April it may be necessary to spray again in February. The plucking away of infested fruits from the trees and the weekly examinations of bandages should be followed up closely if the best results are to be hoped for. There appears to be an impression abroad that the Government in withdrawing the codlin moth regulations intend to abandon the fight. Such is not the case, but it is hoped that neglectful growers may be more effectively dealt with by working under the Act directly instead of by regulations.

NOTES ON VEGETABLE GROWING FOR JANUARY.

By Geo. Quinn, Horticultural Instructor.

The recent rains will prove a great boon to all kinds of summer growing vegetables. Wherever it is practicable the ground around all melon plants should be broken up and made into a fine loose tilth. This is desirable to hold the moisture, and prompt action is necessary not only on this account, but because the rapid extension of the runners will soon make it impracticable. The melons, cucumbers, and beans, have been troubled by thrips very badly this season. These pests always thrive, when owing to stress of weather their host plants receive a series of checks in growth. Various spray washes are known to reduce them, but there is nothing like a good rain and suitable weather to allow the plants to get away into vigorous growth, and render the attacks of these parasites of no moment. Now is a good time to give a little stimulating manure. An ounce or two each of sulphate of ammonia and superphosphate washed into the soil a few inches away from the root stems of each of the melon vines will assist greatly. Where the runners are exposed to the wind it is a good plan to place a clod on the running stem to hold it in position. By this means the growth may be evenly regulated around the central stem. The pinching out of the growing points will check the extension of single runners and make them branch laterally, and thereby increase the production of fruit.

All fruiting crops of beans should have the pods removed with scrupulous care before the seeds develop to any size. Water and manure such as recommended for melons are necessary to the heavy production of pods. These plants must be kept growing and blooming freely or they are profitless. In well drained soils the water may run between the rows almost constantly. Up to the rain referred to, scarcely a decent crop of dwarf beans could be seen on the plains, owing to the ravages of thrips, but it is to be hoped these insects are now done with. Successive sowings of beans should be continued during this month.

Tomato plants of the early settings have died out rather rapidly this season, but specialists to whom specimens were submitted failed to find any specific disease to which the defect might be attributed. It was suggested that the stress of weather or soil conditions were responsible for such a sudden decline as took place. The branches of the bushes should be kept clear from the irrigation channels, as contact with moisture favours the growth of "rotting" fungi and attracts insects.

Make successive sowings of red beet in loose rich soils. This vegetable may be produced all the year round on the plains where water is available. In the winter the deep-rooted sorts are probably best, but in the summer the turnip or globe rooted sorts come on more quickly. The householder will be well advised if he begins to pull them when the roots are about an inch or so in diameter, because if allowed to remain until all are fully developed a proportion will turn pithy, and spoil before all can be used.

Preparations should be made for early crops of winter vegetables, such as cabbage, cauliflower, onion, leek, celery, kohlrabi, Brussels sprouts, lettuce, &c. Suitable seed beds may be made by making a shallow pit frame sunk from three to six inches below the ground level. The soil should be enriched with plenty of well rotted manure. A compost consisting of two parts manure, one part sand, and one part ordinary garden loam will be found suitable. When the seeds are sown they should be covered with finely broken old manure, and carefully watered with a finely rosed water can, so that while the surface is not kept sodden it will always be damp. The cover may be made of calico, or laths of teatree brush, fastened upon a skeleton frame. The latter is, if anything, preferable on account of admitting air freely. The surface of any such bed should be made as nearly level as possible to prevent washing the surface soil and seeds into depressions, where they germinate too thickly to permit sturdy healthy growth taking place.

The surface of the soil should be kept loose between all growing crops, and be mulched with short stable manure wherever practicable. This latter precaution is particularly valuable on the stiff clay loams wherever overhead watering by means of "sprinklers" is carried on.

THE DEPARTMENTAL SPRAYING TESTS FOR CODLIN MOTH.

By George Quinn, Horticultural Instructor.

Good progress is being made by the occupiers of the various plots. In each case three sprayings have been given with Kedzie's arsenite of soda and limewater, as per arrangement. The results up to the present are distinctly promising. The number of moth-infested fruits to be found on the sprayed trees is very small indeed; while on the unsprayed trees kept as checks they are showing up very freely. Inspector Kelly, who is watching the plots at Penwortham and Clare, writes on December 18:—"The sprayed and unsprayed trees stand as object lessons to those who have in the past questioned the utility of spraying for keeping this pest under." On December 23 he gathered up all fallen fruits and picked all he could find affected on the trees. The row of seven check trees unsprayed yielded 102 infested fruits, while the rows on either side of it yielded only three and two infested fruits respectively.

Inspector Trimmer, writing on December 19 respecting the Angaston test plot, says:—"Judging from present appearances I think there will not be more than 20 cases lost out of 1,000 bushels in this garden." At Summertown Mr. Percival says on December 24 that "the check trees are very badly affected, and he was desirous of gathering and destroying all of the affected fruits from them for fear that they would infect the sprayed trees, the fruits on which appeared to be almost absolutely free." At Forest Range Mr. Vicars—presumably through the defective stirring apparatus in his spray pump—was unfortunate enough to scorch some of his trees badly, but they have since recovered. Here the crop of fruit is light, but very little evidence of moth is showing at present. Usually the presence of the pest is more striking where only a light crop of apples is carried. At Mr. Maughan's, at Houghton, the eggs of codlin moth and infested fruits were much more abundant upon unsprayed trees. The same result showed at Messrs. Hannaford's and Schantz's at Chain of Ponds and Piccadilly respectively when last visited. In each case a local committee of growers is watching the results on behalf of the orchardists of the locality, so that an independent opinion will be formed of the results when the tests are concluded.

ORCHARD INSPECTION.

CODLIN MOTH.

In the Barossa district Inspector Trimmer has been engaged in active inspection for 21 days between November 24 and December 17. He reports having made 232 visits to orchards and gardens, chiefly small ones, in and around the townships in that part of the district where fruitgrowing is carried on extensively. Many of the small gardens where the codlin moth is found have been visited twice within the above period. Good progress has been made in scraping trees, putting on bandages, cleaning the ground, and, in many cases, removing trees of little value. In 45 of the gardens no traces of codlin moth could be found. Of the owners of commercial orchards visited 20 are reported to be spraying with arsenites, chiefly the arsenite of soda and limewater, and only 11 having more than 100 apple trees in their plantations are reported as "not spraying." Of these, however, only one is reported as neglectful in carrying out the other precautions, such as bandaging, &c.

Mr. Trimmer writes respecting the spraying as follows:—"Around here the spraying has made old hearts young and young ones jubilant. I wish to specially mention the work of Messrs. Trescowthick Brothers, in whose orchard the moth has been found for three years. With the prospect of a crop of several thousand bushels it is a difficult job to find an infected apple. Their forty-year-old trees are scraped as smooth as glass, and the soil beneath and around them is in perfect condition. Wherever I go I find similar results from the spraying. The people in the townships, especially Angaston, should be commended for the manner in which they are attending to their old trees."

In the Stanley district Inspector Kelly has worked 7½ days between November 24 and December 24. He reports visiting 55 orchards and gardens, 15 of which are as yet apparently free of codlin moth. Twenty owners are reported to be spraying with arsenites, and, with one or two exceptions, the remainder are attending well to the bandaging, cleaning trees, picking off infected fruits, &c. Mr. Kelly writes—"The exceptionally stormy season has retarded spraying operations, but notwithstanding these drawbacks many growers in this district by repeated sprayings have reduced the codlin moth pest materially. In several large orchards where the pest was found last season in almost every apple and pear tree one might search for two hours and not find a single affected fruit. In others, after the second and third sprayings, I frequently find the caterpillars dead just under the skin of the fruit."

In the Mount Lofty Ranges districts Inspector Monks reports having inspected 416 orchards and gardens during the 23 days he has been working between November 24 and December 23. He reports the owners of 55 of these are spraying with arsenite of soda and limewater for codlin moth. A few instances of "scorching" by the spray are reported, and attributed by him to inefficient stirring generally. Mr. Monks states that owing to the impression which prevails in his district that there is no longer any restriction on the sale of the affected fruits, and that the garden regulations are withdrawn, he finds that very little has been done to check the pest outside the persons who have sprayed. The impression conveyed is that very little will be done without legal pressure, as the ordinary precautions of scraping, bandaging, and cleaning the soil are, with few exceptions, almost entirely neglected. This is in strong contrast with the reports from the other districts, and even when all things are considered, is not a desirable state of affairs. It is also significant that it is almost entirely from growers in this district that the opposition to the law prohibiting the sale of infested fruit and providing for precautionary measures in the orchard comes. With a view to economy the inspection of orchards and gardens in the south-east generally has been abandoned. To enable the owners of the promising orchards at Coonawarra to protect themselves Mr. S. R. Pounsett, an enterprising fruitgrower there, has been appointed an inspector under the Act, and will begin his work with the new year.

OVERSTOCKING AND FOREST DENUDATION.

THEIR RESULTS IN MOUNTAINOUS COUNTRY.

In a bulletin (No. 44) issued by the Arizona Agricultural Experiment Station on the river irrigating waters of Arizona, the disastrous effects resulting from overgrazing by stock and the destruction of timber in mountainous country are vividly illustrated. The most important water supply is from the Salt River, which is formed by the junction of two rivers—the Salt and the Verde. Above their junction the two rivers are of equal length, about 170 miles, but the area of the watershed of the Salt River is 6,260 square miles, against 6,000 square miles of the Verde, while the elevation of the head waters of the two is 8,000 to 9,000 feet and 6,000 to 7,000 feet respectively. The contour of the watershed of the Salt River is more precipitous than that of the Verde, and the rainfall at the head waters in 1898 was 20.6 in. and 13.1 in. respectively, the character of the rainfall being generally similar but distinctly heavier at the head waters of the Salt River. The annual discharge of water in the Salt River is naturally considerably more than that of the

Verde, i.e. 37 per cent. greater. With practically equal length and drainage, but with a steeper watershed and a much heavier rainfall, the Salt River should be expected to deliver higher floods as well as a greater amount of water; but this is not the case, the heaviest floods in most instances coming down the Verde, and the rise and fall of the water in the latter river is much more abrupt than the Salt River. The conditions of the watershed alone can account for the more rapid drainage of the Verde. Originally the country tributary to the rivers was similar, the higher mountain slopes and tablelands being forested and the foothills and valleys covered with grass. The upper watershed of the Salt River remains in nearly primitive condition, while the Verde country for 30 years has been grazed with sheep and cattle, and has supplied timber for mines and sawmills, with the result that the water rushes away more rapidly and carries off considerable quantities of silt; in fact the overgrazed and lumbered districts of the Verde are stated to have washed badly of late years. The difference in the character of the two streams at their junction is also shown in the following table:—

PERCENTAGE OF WEIGHT OF SILT IN THE SALT AND VERDE RIVERS.

1901.	Jan. 1-31	Feb. 1-15	Feb. 16-28	Mar. 1-31	April 1-18
	per cent.	per cent.	per cent.	per cent.	per cent.
Salt River	·026	·053	·012	·0099	·00021
Verde River ...	·0469	·0874	·1569	·024	·00033

Another Arizona river—the Gila—shows the effect of overgrazing on the character of its waters in a marked manner. Originally 90 per cent. of the watershed consisted of open grass-covered country, which has been for years so heavily stocked that the grasses have everywhere been depleted, and in some parts practically destroyed. The rains, coming upon these bared and trampled ranges, fall with but little obstruction into the watercourses, giving rise to sudden and violent floods of great erosive power, which carry off enormous quantities of silt. The Gila River is said by the residents to be one of the muddiest in the world, and tests justify this statement. In flood time the quantity of silt has reached a maximum of 9.41 per cent., and a local farmer vouches for the statement that four bucketfuls of water on being evaporated, left behind a bucketful of silt. The water from the river turned into a basin 300 feet long, 36 feet wide, and 1½ feet deep completely filled it with sediment in three weeks.

In the more hilly districts of South Australia ample evidence of the damage by "washes" and "slides" can be seen, but the destruction of the natural herbage by overgrazing and fires still goes on, and timber is destroyed without any consideration of the result certain to ensue.

WOOL NOTES.

BY G. JEFFREY.

It will have been noticed that my recent articles have dealt with the subject from a commercial rather than a technical standpoint; and, seeing that I lecture at so many places, this is perhaps the best way to treat the subject for The Journal. As the wool market is practically the same as it was a month ago, and the chances are that no material change will take place in the near future, it may be as well to deal with the sheep market in this article. The glorious rains which have fallen right through Australia during the last month will have a considerable effect on the sale of sheep; in fact, already the change has been noticeable, more particularly in connection with store sheep. In fact, immediately after the rain standing offers to sell store sheep were at once withdrawn, and the price was raised, in many cases, 5/ per head. But the question which affects the sheepfarmer is—"Are the increased prices likely to last?" It will be well to calmly face the position, and not be carried away with the cry that store sheep must be worth even more money in the near future. We have to remember that, so far as most places in the south and the lower north are concerned, the rains were too late to do any practical good to the grass; in fact, we must admit that summer rains do more harm than good in this respect. We must, therefore, depend on our back country to take the surplus store sheep, and we have to consider if the rains which have already fallen are sufficient to bring up feed enough to justify northern squatters purchasing extensively. My own conviction is that, although the recent rains have done incalculable good, providing abundance of water, in most cases the fall was too sudden to do very much good in the way of bringing up feed, and, unless more rain falls soon, the price of store sheep is likely to come down. On the other hand, if what we have had, is followed up by further general rains, store sheep, especially ewes, should be very valuable stock. There is one point, though, that must not be lost sight of by those holding store ewes for sale, viz., that unless northerners take them soon it will be too late to put the rams with them. It might be advisable, therefore, to put the rams with the ewes at once; then, if the rains come, ewes in lamb will command very high prices.

As to fat sheep, there seems every prospect of even higher prices than have already been given, as this class of stock is very scarce. Some time ago practically all the available sheep in anything like good forward condition were bought for South Africa, thus leaving the market even shorter than it would have been, and the recent rains cannot possibly have much effect on the fat market for a considerable time.

DATES OF MEETINGS OF BRANCH AGRICULTURAL BUREAUX.

With a view of publishing in the "Journal" the dates of meetings of the Agricultural Bureaux, Hon. Secretaries are requested to forward dates of their next meeting in time for publication.

BRANCH.	Date of Meeting.		BRANCH	Date of Meeting.	
	1903.	1903.		1903	1903
Ardrossan	Jan. 10	--	Nantawarra	Jan 7	11
Balaklava	10	14	Naracoorte	10	—
Burra	—	13	Norton's Summit	9	6
Cherry Gardens	13	10	Onetree Hill	9	6
Clare	9	6	Port Elliot	17	21
Finniss	Mar. 2		Port Germein	10	—
Forest Range	Jan. 8	Feb. 12	Quorn	10	—
Hartley	—	13	Reeves Plains	9	6
Kanmantoo	2	6	Rhine Villa	9	6
Kapunda	—	7	Riverton	10	7
Kingston	3	7	Saddleworth	16	20
Koolunga	8	—	Stansbury	3	7
Maitland	3	7	Whyte Yarcowie	24	—
Morgan	10	7	Willunga	3	7
Mount Compass	10	—	Wilmington	7	11
Mount Remarkable	Jan. 8	Feb. 12	Yankalilla	Mar. 6	

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report on January 1:—

When the history of 1902 is written up the first eleven months will appear as the driest and most disastrous on record throughout Australia; but fortunately the drought broke up early in December, when monsoonal rains set in, and that month must stand out boldly as one of the wettest recorded, the rainfall providentially being heaviest mostly in the drought-stricken districts. This was followed up by mild weather and further showers, so that the benefit is almost incalculable, especially to the graziers, most of whom are now assured of summer feed; and in the Northern farming areas in this State the creeks ran bankers, filling the dams and giving a supply of water for months to come, so that the new year starts, from a producer's standpoint, with every prospect pleasing

It could scarcely be expected that a general rain would suit all parties, for considerable quantities of wheat were damaged that had been reaped and standing in heaps, that which was not reaped also suffering, being considerably bleached compared with the high quality of the earlier deliveries.' Both wheat and flour are now being exported in great quantities to Melbourne, Sydney, and Queensland and this is likely to continue until those markets receive supplies from America, which are not expected until the end of present month. Values have remained firm, and very full prices are now being paid. In flour, although a good deal of business has been done locally, bakers are looking forward to obtaining their supply on more favourable terms later on. It is generally reckoned that forward sales will be made for export to the Eastern and Western markets Offal lines have suffered in price, the excellent rains lessening the demand from the Eastern States, so that values now are much easier.

Good business characterized the month, feeding lines especially experiencing heavy demand to fill orders for New South Wales, but as the herbage in most of the districts there is now coming on nicely shipments of chaff during the last week or ten days have only been in completion of orders already booked, values now showing a decided easing.

Potatoes.—Those from the hills near to the city have been supplying the market, the quality of same being quite up to the usual standard and with Gambier grown already beginning to be talked of, rates for local have, during the month, eased quite a couple of pounds. Onions continue to come forward freely, but the quality marketed at this time of the year unfits them for export purposes; rates, therefore, are weak.

As usual with the near approach of Christmas, trade in dairy produce was most active, all lines participating in the strong seasonable demand. The first effect of the rain was to immediately check the supplies of butter and cream reaching the city, which resulted in a sharp advance in price; but the favourable weather has also prolonged the season, and, with speculators in Victoria unable to cope with all coming forward, shipments are being made from Melbourne to London, so that prices here have receded, and it is generally reckoned that any alteration in the near future will be of a further easing character. Good business has been put through in eggs, both Western Australia and New South Wales operating heavily on this market, and until Christmas orders were filled rates hardened, but have since receded, although at moment of reporting, owing to supplies being disorganized, the market is bare. In cheese, South Australian make has scarcely been equal to the trade requirements, and several parcels have been brought along from the Eastern States; prices therefore have given way somewhat. Bacon—Owing to the dearth of feeding lines the live animal has continued scarce, and extreme high rates ruled for the cured article, until shipments of frozen pork were landed in Sydney from 'Frisco, the result being that values are weak at quite 1d. to 1½d. under former quotations. Hams, as expected, have been in strong request, so that curers' stocks are now short. Honey and almonds have been in fair demand.

Poultry.—In live poultry during the early part of the month prices were depressed, owing to the poor quality of half-fed birds that were being marketed, but as there was a decided improvement in those forwarded during the Christmas sales, notwithstanding the penning was unusually heavy, highly satisfactory rates were secured.

MARKET QUOTATIONS OF THE DAY.

Wheat.—At Port Adelaide shipping parcels, 5/2 to 5/2½, f.o.b.; farmers' lots, 5/ to 5/1, on trucks, per bushel 60 lb.

Flour.—City brands, £11; country, £10 5/ per ton of 2,000 lb.

Bran 1/3 and pollard 1/4 per bushel of 20 lb.

Oats.—Local Algerian and dun, 3/ to 3/4; prime stout feeding whites, 3/5 to 3/7 per bushel of 40 ℔.

Barley.—Malting, 4/9 to 5/; Cape, nominal, 3/6 to 4/ per bushel of 50 ℔.

Chaff.—£4 7/6 to £4 15/ per ton of 2,240 ℔., bags in, dumped, f.o.b., Port Adelaide.

Potatoes.—New locals, £8 to £9 per 2,240 ℔.

Onions.—Local, £3 10/.

Butter.—Creamery and factory prints, 1/ to 1/1; private separator and best dairy, 10¾d. to 1/; well-graded store, 9d. to 10d.

Cheese.—S.A. factory, new, 7½d. to 8d.; prime matured, 8½d.

Bacon.—Factory-cured sides, 10½d.; farm lots, 8d. to 9d.

Hams.—S.A. factory, 1/ to 1/1 per ℔.

Eggs.—Loose, 9d.; in casks, f.o.b., 11d. per dozen.

Lard.—In bladders, 8¾d.; tins, 8d. per ℔.

Honey.—2½d. to 2¾d. for best extracted in 60-℔. tins; beeswax, 1/½ per ℔.

Almonds.—Fine softshells, 5d.; kernels, 10d. per ℔.

Above quotations, unless when otherwise specified, are duty paid values on imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

Broad v. Narrow Tires.—Mr. H. H. Westenhall, Carr's plains, Stawell, writes to The Australasian.—Noticing some comment by "R.D." on the broad v. narrow tires and experiments in America, I think it may be of interest and value to some of the readers of The Australasian to know some facts (equal to what you have shown as done in America), which are realized here. In the Richardson Valley, and near here, there are a number of farmers who all give the same opinion. Mr. E. Erwin, who has to cart his wheat 25 miles, used to take 50 to 55 bags on six horses with 3 inch tires; now he has 5 inch tires, and five horses to do the work (the same load). Mr. E. Evans, whose experience was practically the same, says, "The long and short of it is, it is a horse less." Our experience with a wagon and 3 inch tires was that it took five horses all their time to take 40 bags of wheat to Stawell. Then we put 5 inch tires on these wheels, and the same team took 55 bags every trip. On this wagon we send loads of 44 bales of wool, frequently weighing 6 tons 10 cwt. without horse feed or the driver, which would weigh 3 cwt. or more; and five horses do it easily, only having to exert themselves at the hills; the sand does not give them much trouble.. This team went into Stawell (23 miles), and unloaded one day and out and loaded the next, for six weeks, never missing a day, except Sunday, and carted 726 bales, making the average load about 5 ton 15 cwt. It would be hard to over-estimate the value of these broad tires over narrow. As an instance of the effect on soft ground, our teams, a four horse and five horse, used to load up wheat out in the field 100 bags, and pull it out without double-banking. This so influenced several (who saw it done continuously) that they went in for them. Altogether, within a radius of 12 miles there are more than 10 of these broad tires, all adopted in the last six or seven years.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of December, 1902:—

Adelaide	2·57	Manoora	3·65	Macclesfield	2·35
Hawker	1·45	Hoyleton	2·85	Meadows	2·43
Cradock	2·40	Balaklava	2·30	Strathalbyn	1·90
Wilson	2·03	Port Wakefield	2·56	Callington	2·45
Gordon	1·39	Saddleworth	4·41	Langhorne's Bridge	1·85
Quorn	0·94	Marrabel	3·38	Milang	1·80
Port Augusta	1·04	Riverton	4·87	Wallaroo	2·28
Port Germein	3·43	Tarlee	3·58	Kadina	1·85
Port Pirie	2·52	Stockport	2·97	Moonta	1·61
Crystal Brook	2·71	Hamley Bridge	2·50	Green's Plains	2·18
Port Broughton	1·49	Kapunda	4·06	Maitland	2·20
Bute	1·43	Freeling	2·50	Ardrossan	1·37
Hammond	1·38	Stockwell	2·86	Port Victoria	1·86
Bruce	1·00	Nuriootpa	3·54	Curramulka	2·00
Wilmington	2·29	Angaston	3·98	Minlaton	1·57
Melrose	3·41	Tanunda	3·07	Stansbury	1·15
Booleroo Centre	2·35	Lyndoch	2·96	Warooka	1 84
Wirrabara	2·51	Mallala	2·38	Yorketown	1·16
Appila	1·71	Roseworthy	2·59	Edithburgh	0·94
Laura	2·68	Gawler	2·95	Fowler's Bay	1·39
Caltowie	2·81	Smithfield	2·60	Streaky Bay	1·10
Jamestown	2·11	Two Wells	2·48	Port Elliston	1·63
Gladstone	2·30	Virginia	2·79	Port Lincoln	2·22
Georgetown	2·72	Salisbury	2·19	Cowell	1·65
Narridy	2·05	Tea Tree Gully	3·50	Queenscliffe	1·75
Redhill	2·47	Magill	2·65	Port Elliot	1·91
Koolunga	2·29	Mitcham	3·09	Goolwa	2·40
Carrieton	2·32	Crafers	4·84	Meningie	1·97
Eurelia	1·95	Clarendon	4·80	Kingston	4·08
Johnsburg	1·43	Morphett Vale	2·79	Robe	3·27
Orroroo	1·69	Noarlunga	2·25	Beachport	4·63
Black Rock	1·31	Willunga	3·84	Coonalpyn	2·51
Petersburg	1·54	Aldinga	2·72	Bordertown	5·12
Yongala	1·67	Normanville	2·43	Wolseley	3·18
Terowie	1·53	Yankalilla	2·77	Frances	2·74
Yarcowie	1·27	Eudunda	2·74	Naracoorte	3·40
Hallett	1·87	Truro	2·62	Lucindale	4·76
Mt. Bryan	2·73	Mount Pleasant	1·88	Penola	4·71
Burra	2·40	Blumberg	2·56	Millicent	4·32
Snowtown	1·48	Gumeracha	2·24	Mount Gambier	7·05
Brinkworth	1·95	Lobethal	2·77	Wellington	2·33
Blyth	1·87	Woodside	2·37	Murray Bridge	2·68
Clare	3·40	Hahndorf	2·74	Mannum	2·58
Mintaro Central	3·75	Nairne	3·05	Morgan	1·17
Watervale	5·15	Mount Barker	2·75	Overland Corner	1·32
Auburn	4·58	Echunga	2·49	Renmark	1·62

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AGRICULTURAL BUREAU REPORTS.

Bute, November 11.

Present—Messrs. Brideson (chair), Ebsary, McEvoy, Masters, Gitsham, Commons, Stephens, H. and A. Schroeter, Trengove, Sharman (Hon. Secretary), and one visitor.

Takeall.—Some discussion on this subject took place, and enquiry was made as to result of analysis of sample of infested soil sent to Germany by the Chairman of the Central Bureau. [Owing to the death of the gentleman who undertook to do this for Mr. Krichauff nothing resulted.—Ed.]

Mount Bryan East, November 15.

Present—Messrs. Dunstan (chair), Pohlner, Taylor, T. and E. S. Wilks (Hon. Secretary), and three visitors.

Harvest Results.—Mr. Pohlner stated that he treated plots of wheat with Billsted's manure and super, the latter being better both in straw and grain. Members estimated that this year the average for the district would hardly exceed 2 bushels per acre. Crops on fallow are superior to those on newly ploughed land.

Ophthalmia.—Blindness in sheep is reported to be prevalent.

Dowlingville, November 14.

Present—Messrs. Phelps (chair), Montgomery, Burkin, Mason, Rooney, and Lock (Hon. Secretary).

Increasing the Feed.—Mr. Lock read a paper on "What Means Can be Adopted to Get More Feed to Grow?":—

Grazing has become a very important item to even the small landholder, and the rearing of stock, or buying store stock to fatten, promises to become almost, if not quite, as important as growing grain for market, and the question of how to increase the feed supply is of considerable interest to the grazier. Experiments in the manuring of the natural pasture do not appear to have been a great success. In some parts of the Peninsula near the coast wheat paddocks left out of cultivation for a few years become so hard on the surface that they do not absorb or retain the moisture nearly so well as when cultivated. In some cases very little feed grows, and the paddocks become almost worthless until broken up again and brought to a condition to produce good feed. Under present conditions if the land is worked, as it should be, to get a good clean crop of wheat, we must destroy a lot of the natural feed, and most of the wild oats. With good weather at harvest and suitable kinds of wheat, good machinery will take off nearly all the grain, and there is not enough on the ground to grow a decent self-sown crop. Then stock are put in to eat any heads missed, and the consequence is that the stubble paddock, which is in good condition to grow a fine crop of feed, produces very little owing to being too clean. Now this could be remedied without much trouble by broadcasting, say, a bushel of oats per acre on the stubble, and harrowing it in in the autumn. This would produce splendid feed, as oats do well after wheat. Then it is important that the farmer should have green feed as early as possible, and he was convinced that if several acres of well-worked fallow were sown after the first good rain of the season with barley, rye, or wheat, with a good dressing of super, that, taking one year with another, the land so treated will pay better than any other portion of the farm. It was a good plan to use all the stable manure in a small paddock kept for feed; every year manuring some portion of it. By doing this the paddock will produce good feed, and there will not be much difficulty with weeds. If this manure is put sometimes in one paddock and sometimes in another there will often be as much growth of weeds as wheat in the crop.

Mr. Phelps always applied stable manure to the same paddock; he rotted it in a heap before spreading. He did not consider it would do on this land to spread the manure fresh from the stable. Mr. Mason found that oats did well after wheat.

Rhine Villa, November 15.

Present—Messrs. G. A. Payne (chair), F. F. and H. W. Payne, Start, W. T. and J. Vigar (Hon. Secretary), and one visitor.

Angaston Conference.—Delegates reported on proceedings of Conference, and gave a glowing account of the Angaston district generally. The paper on "Stock," by Mr. Rundle, of Tarawatta, was specially appreciated. Some discussion on irrigation took place.

Stansbury, November 8.

Present—Messrs. A Anderson (chair). P. Anderson. Henderson. Jones, Antonio. Sherriff, and Cornish (Hon. Secretary).

Black Rust.—Members reported that this disease was prevalent in the crops, but they noticed that it was absent in crops on land which was sown to oats last year.

Farming.- Mr. Antonio read a paper on "General Farming." He strongly advocated thorough working of the soil, and would not put in the seed until the land was in good tilth; this year he had to wait till the end of June before he could sow some land, and the crop looks remarkably well. Every farmer should keep a few fowls and pigs, as they keep down the food bills, and also bring in a little cash. The horses should be well fed and properly bedded and cleaned every morning before being harnessed. The stables should be cleaned out every day. Mr. Faulkner read a paper on this subject at the previous meeting. He advocated fallowing as early as possible to give the weeds a chance to grow, and then to cultivate thoroughly to destroy the weeds. If the land is fallowed and well cultivated it is possible to get on with seeding operations earlier in the season. He found fallowed land gave quite double the crop that unfallowed land produced. Fallowing was the only way to clean the land. Keep as many sheep as can be properly fed, but do not overstock. The merino was the best breed for most farmers, but for early lambs the Shropshire cross was very valuable. He advocated the growing of rust-resistant wheats, and spoke favourably of Marshall's No. 3, Majestic, and Gluyas. He considered the hoe drill superior to the disc drill in clear land, but in dirty or stubble land the latter was very useful.

Forest Range, November 13.

Present—Messrs. Monks (chair), Vickers, Townsend, Gunn, J., H., A., and R. Green, McLaren, Waters, and F. Green (Hon. Secretary).

Dieback of Raspberry Canes.—Discussion took place on the cause of this trouble. Mr. Vickers attributed it to heavy rains about the end of the year, causing new vigorous growth which failed to mature in the hot dry weather following. Mr. McLaren thought insufficient flow of sap in the dry weather was the cause. Members would like to hear the opinions of members of other Branches.

Arsenical Spraying.—Mr. Vickers mentioned that while growers in this district had severely burnt their trees with the arsenite of soda, in other parts the trees were not injured. He would like to know why this was so; possibly some fault in mixing was the cause of the injury. Mr. Monks thought it was impossible to be too careful in using the arsenic. From what he had seen he believed that the lime was often not slaked sufficiently, and sometimes too little was used. He believed that half an hour was not long enough to allow for the lime to neutralise the arsenic. Mr. Sandow, of Grunthal, considered 1½ hours necessary when using the Hay Valley lime; he mixes early in the morning sufficient to spray up till dinner time, and before dinner prepares the solution required for the rest of the day.

Lipson, November 1.

Present—Messrs. Potter (chair), C. and G. Provis, Brougham, Baillie, McCullam, Carr, Brown, Barraud (Hon. Secretary), and two visitors.

Manures and Fallowing.—This meeting was held at the residence of the Chairman for the purpose of inspecting the experimental manure plots. There were twelve plots in all, each of 2¼ acres in area, and different quantities and kinds of manure had been applied. All the plots were sown with Silver King wheat, and the experiment was regarded by all present as a splendid object lesson in the value of manures. On the plots receiving mineral super the crops were exceedingly good, the yields being estimated at from 11 bushels per acre, where 84 lb. per acre had been applied, to 24 bushels on plot receiving 200 lb. per acre. The Thomas phosphate plots will only yield about 8 bushels, and the unmanured plot about 3 bushels per acre. [Full report on tests will be published in January or February issue of Journal of Agriculture. —Ed.] The Hon. Secretary reported on his experience of the use of manure on fallowed land for wheat. The first year he averaged 15 bushels per acre, next year 16 bushels, last year only 6 bushels, but this was due to damage by rust, and this season he was getting 12 bushels to 14 bushels per acre. Mr. C. Provis noticed that the manured crops ripened early and more evenly than the unmanured, an important consideration, especially in this district. Mr. G. Provis was of opinion that even in very dry years land fallowed to depth of 4 in. to 6 in., and well worked would always produce a crop. Shallow ploughed land will give a fair return in a good season, but the practice was too risky.

Mannum, November 21.

Present—Messrs. Preiss (chair), Walker, J. L. and R. P. Scott, Baseby, Schuetze, Schulze, and Wilson (Hon. Secretary).

Conference.—It was decided that the Annual Conference of River Murray Branches be held at Mannum on February 25 and 26, 1903. Mr. Preiss read a paper on water conservation, and it was decided to hold the paper over for the Conference.

Ardrossan, December 13.

Present—Messrs. Dinham (chair), Aldenhoven, Endersby, Henderson, Cave, Cornish, Wilson Allison, and Opie (Hon. Sec.).

Cattle Complaint.—Mr. Henderson stated that after reading in the December Journal Mr. Bickford's report on post-mortem examination of diseased cattle he was satisfied that the cow he referred to at previous meeting was suffering from apoplexy of the brain.

Selection of Seed.—Mr. Opie urged the necessity for careful selection of seed wheat by farmers. In every crop there would be found some plants much superior to others, and farmers would do well to gather the seed of these and sow. There was quite as much reason for sowing only the best wheat as there was for breeding from the best stock available. Members generally agreed that too great importance could not be attached to the sowing of properly matured seed wheat.

Cost of Farming on West Coast.—Paper in December issue by Mr. D. P. Thomas was well discussed, and a resolution was carried to the effect that farming will pay in this district with a yield of 8 bushels per acre and wheat at 2/6, but the profits would not be equal to those shown by Mr. Thomas. Several points in the paper were criticised. There was no provision for hay and horsefeed, the whole of the crop being reaped; the cost of water supply was not taken into consideration; the amount set out for fencing was too small for effective work; a five-roomed house would cost more than £100; nothing was allowed for wages of hired men or the farmer's sons. On the other hand, while agreeing generally with the tenor of the paper, members thought that the revenue from lambs, butter, and sundries was far under the mark.

Crystal Brook, November 15.

Present—Messrs. R. Pavy (chair), W. and A. Hamlyn, P. Pavy, Hutchison, Davidson, Morrish, Venning, Symons (Hon. Secretary), and three visitors.

Conference.—As majority of Branches favoured holding the Annual Conference at Crystal Brook, it was decided to hold the Conference on February 13.

How to Increase the Productiveness of the Soil.—Mr. P. Pavy read some notes on this subject, suggesting the following points for discussion:—

Increase the rainfall and we can increase the production from the land, but as we have no control over the rainfall we must work on other ways of increasing the returns from our land. First, can we get a greater return in proportion to the outlay from grazing alone than from wheatgrowing, or should we combine the two? Then what is cultivation, and do we adopt the best and most economical means of working? The Journal of Agriculture states that 300 to 500 tons of water are required to produce a crop containing a ton of dry vegetable matter. This is equivalent to 3 to 5 in. of rain on an acre, so that if we could conserve all that falls we should be able to grow a ton of hay on 5 in. of rain. This proves that necessity for conserving as much moisture as possible in the soil, and we are told that by keeping the surface 2 in. of soil loose we greatly retard evaporation. Do we pay sufficient attention to this point? Are we acquainted with the best tools for cultivating the land? A disc-roller, which is said to firm the soil underneath and at the same time keeps the soil moist, is referred to in a recent issue of the Journal. Would this not be an improvement on the ordinary roller, which causes the surface to cake? Then we must, besides making the best use of the rain, see that we keep the land in good heart. Phosphatic manures have proved most valuable in many districts, but it is possible that their use will diminish the available store of other elements in the soil, and unless by the use of stable manure or some other means we restore these elements, we will not increase the productiveness of the soil. The questions that now arise are:—Which is the best method of applying this manure; to cart direct from the stable, or allow it to rot in pit or heap and then spread it? Which is the best means of rotting if it is not advisable to spread it direct from the stable? Again, if the soil can be improved by the addition of farmyard manure, will it not pay to sell the produce of the farm in more concentrated form than wheat and hay? For instance, instead of selling hay, would it not pay better to make ensilage to feed to stock, and sell fat cattle, sheep, or pigs? If this will pay we will make more manure on the farm, and be able to grow more feed, and carry more stock, in fact increase the productiveness of the farm all round.

Reeves Plains, November 14.

Present—Messrs. Folland (chair), H. and W. Day, Oliver, Dawkins, Richter, McCord (Hon. Secretary), and several visitors.

Farm Horses and their Treatment.—Mr. R. H. Oliver read a paper on this subject:—

For the small farmer who does most of his own work, and who carts his produce to market, a heavy team is best, as they are, as a rule, more tractable and more reliable for road work than crossbreds. They should not be coarse, hairy-legged animals, but possess good flat bone. In his opinion the Clydesdale was most suitable to their requirements, as it has weight and action. While a good mare of almost any sort may throw good stock to a suitable pure-bred stallion, it is better to have the breed on both sides. It was a mistake to use an inferior stallion to save 10/ for service fee. Where the farmer keeps two or three teams some medium draughts will be useful. While he admitted that draught stock had deteriorated to a certain extent, he believed it was quite as much due to neglect in feeding the young stock as to faulty breeding. Horses must be fed well; he fed short stuff morning and noon, and long hay at night. For long hay the crop should be cut soon after the bloom has fallen, but for chaff it is better to leave it longer to get a little grain in it. He found oats the best grain to mix with chaff for horses. The best hay on the farm should be kept for feeding, and if any is weedy, sell it, even if at reduced price. After breaking the horse in, only work him for a few hours at a time at first, and take care that he does not get sore shoulders. It was impossible to prevent some horses getting sore, but when every horse in the team has sore shoulders it is plain evidence that it is the teamster's fault. Sometimes the sore can be eased by altering the draught of the harness. Every horse should be worked with back bands, as they keep the draught off the point of the shoulders. The old style of whipple-trees was better than chains and spreaders, as the horse is brought nearer to his work, and they give with him as he walks. Winkers were decidedly better than the open headstall. At this season of the year breeding mares should be in good condition and not overworked; often the stallion gets blamed because the mare does not produce a foal, whereas the result may be due to the low condition of mare. Great care should be taken by teamsters not to overload their teams. One ton per horse is good loading, and if carters cannot make it pay at that he was sure they would not do so by heavier loading. Horses should be well cleaned every morning; some may think this waste of time, but in his opinion it was time well spent.

Mr. W. Day did not like hay cut too green; he liked a little corn in it. A good fitting collar was more to the point than altering the draught of the harness, and backbands were unnecessary. Mr. H. Day considered long hay better than chaff, as it was better masticated. It would be a good thing if the Government would station a draught stallion at the College. Mr. Richter thought medium draughts best for farm work. He believed in short feed when working hard. He did not approve of the suggestion that the Government should purchase a stallion for the College farm. Mr. Dawkins also favoured the medium draught, and thought the Suffolk Punch most suitable. He considered the backband necessary, especially with young horses, as in turning very often the chains were slack, and they were liable to get between the legs.

Dairy Cows and Barley Straw.—Mr. W. Day wished to know whether barley straw could be fed to dairy cows without injury; he had heard it dried up the milk. Members had no experience, but thought there was very little nourishment in straw of any sort. Mr. Dawkins suggested chaffing the straw and mixing it with treacle. The Hon. Secretary wished to know how barley compared with wheat in respect to the constituents it removed from the soil. [Straw of any kind is, of course, not as nutritious as well prepared hay; but in conjunction with corn of various kinds it forms in many countries the staple bulk food for horses and cattle; and so far as we know stock take to barley straw better than any other straw. It has also frequently been used in conjunction with molasses for dairy cattle; it must be noted, however, that it can only form a portion of the feeding ration, to which some more concentrated food, such as bran, crushed corn, copra cake, &c., should be added. We hope to publish results of some such experiments in the January issue So far as we know, weight for weight, barley is no more exhausting than wheat.—Ed.]

Amyton, November 8.

Present—Messrs. Mills (chair), Hawke, Gum, and Mullett (Hon. Secretary).

Capillary Attraction.—Mr. Mullett read an interesting paper describing the movement of water in soil by capillary attraction, and the part played by cultivation in preventing the escape of moisture from the soil.

Boothby, November 25.

Present—Messrs. Foulds (chair), Carn, Sims, Bell, Way, Bradley, Turnbull (Hon. Secretary), and three visitors.

Stable Manure.—Discussion took place on the use of stable manure, and it was resolved that in the opinion of this Branch bulk manures are not suitable in our dry climate.

Preservation of Skins.—In reply to enquiry, Mr. Carn recommended dressing of arsenic and soap to preserve skins from the attack of weevils. Mr. Way said those who were obliged to keep hides for any length of time would find it advantageous to bury them, as they will keep fresh and good.

Curing Meat.—Mr. Carn said he always cured in a barrel, using equal quantities of salt and sugar, with a little saltpetre and spice added. Mr. Foulds favoured hanging the meat in a bag, well exposed to the air, with which Mr. Sims agreed. The latter said with pigs it was a good plan to rub salt well in directly after scalding, as it will bring out the particles of dirt and water.

Old and Young Poultry.—Mr. Carn criticised statement in paper read some months ago at Port Pirie branch to the effect that it did not pay to keep fowls for laying purposes after their second season. He had every reason to believe that hens were not so prolific the second year as from three to four years old. Last year he had 40 to 50 fowls, including roosters, and during the year, besides those used on the farm, he sold 260 dozen. All the hens were from three to five years old. The gross income was about £12, and the profit £8 13/8. [These figures are too indefinite to be of much value. "40 to 50 fowls, including roosters," is very indefinite, and there is nothing to show how many eggs were consumed in the house; 260 dozen eggs from 40 fowls would be a poor return from a well-kept flock, even after allowing for a large consumption on the farm.—Ed.]

Port Lincoln, November 21.

Present—Messrs. Laidlaw (chair), Bruce, Sullivan, O'Shanahan, Puckridge, Anderson, Kinmont (Hon. Secretary), and a number of visitors, including Hon. R. Butler (Minister of Agriculture).

Farming.—Mr. Butler gave an address dealing largely with the possibilities of Koppio and other land in the locality to be made available for selection. With the soil and rainfall he was sure the hills were admirably adapted to viticulture and dairying. The lamb trade should also be a large factor in the prosperity of the district. With good cultivation and the use of manures the district would yield very good returns of wheat, and with an increased production the district would soon have better shipping facilities provided. Mr. Butler referred to his own experiences of farming, and the results secured under various conditions.

Mount Gambler, November 26.

Present—Messrs. Mitchell (chair), Dyke, Wilson, D. Norman, sen., D. Norman, jun., Clarke, Watson, Barrows, Ruwoldt, Wedd, and Lewis (Hon. Secretary).

Visit of Inspection.—This was the occasion of the annual inspection by members of the Bureau of farms and other places of interest in the district. At Mr. A. MacArthur's farm special interest was shown in the pigs, from 80 to 90 well-bred animals being seen in the styes. The breeding sows and young pigs are allowed good scope for grazing, and the pens for fattening are of a substantial character. The most scrupulous cleanliness is observed, the pens being cleaned out three times a week, and new bedding put in. Mr. MacArthur keeps to the Berkshire, as he finds them very good doers. Shropshire sheep for the production of early lambs also receive attention here. At Mr. Kilsby's homestead the garden and commodious outbuildings received most attention. The house and garden are splendidly sheltered by pines all round. Mr. Pritchard's farm at Myora was also visited. Members were greatly interested in the change wrought by the present owner since he purchased it 20 years ago. The land is rather sandy, but grows good crops, and after being broken up produces good grass. The Black Swamp paddock, which was formerly black sand, covered with ferns and teatree, was cropped last year, and is now splendidly grassed, 350 bullocks being fattened on 400 acres. Besides the area under crop, about 1,300 acres, Mr. Pritchard has over 10 000 sheep on the property. Many matters of interest about the machinery, especially conveniences and improvements made by Mr. Percy Pritchard, were seen. In thanking Mr. Pritchard for his kindness to the visitors, reference was made to the change in the country for the better, brought about by careful treatment, and Mr. Wedd stated that whereas it was now carrying 10 sheep to the acre, when he knew it first it would hardly support one sheep to the acre. Mr. Pritchard stated that, although he had been to considerable expense to improve the land, year by year he had seen the good results from his work, and would continue until he had broken up all the land that was capable of improvement. He found grass did very much better after oats than after wheat, and also that oats were the best fern destroyers he knew of.

Lyndoch, November 13.

Present—Messrs. Kennedy (chair), Rushall, W. J., A., and H. Springbett, Woolcock, Warren, Ken, and Mitchell (Hon. Secretary).

Orange Cultivation.—Mr. James Woolcock read a lengthy paper on the "Cultivation of the Orange." Where the soil was at all clayey he recommended trenching about 2 ft. deep, taking care to keep the surface soil on the surface. With sandy and alluvial soil double ploughing is sufficient. Set the trees out at 20 ft. apart, on the septuple system. Digging holes for the trees in heavy ground is a great mistake, as the water accumulates in the holes in the winter and destroys the roots. Care must be taken not to plant too deep. It was better to plant practically on the surface, and draw the soil from around to make a slope up to the stem. He had most success when setting out trees in the autumn, as the roots had time to establish themselves before the dry weather sets in. All damaged roots should be cut off above the injury when planting. In mulching with stable manure care must be taken to avoid placing any against the stem. Watering is an important factor in successful orange growing, as no fruit tree shows more quickly the effect of insufficient moisture. The soil through the summer must be supplied with sufficient water to prevent it getting dry. Young trees require but little pruning until they reach fruit-bearing age, all that is necessary being to keep them in shape. In older trees thin out crowded branches, always leaving the strongest, and also remove those shoots that have done bearing. Careful attention is necessary to prevent damage by insects. The aphis and scale can be destroyed by spraying with kerosine emulsion or resin wash; but the soldier bug, with reddish-yellow marks across the back, is best combated by shaking them off on a damp morning, and destroying them.

Ardrossan, November 15.

Present—Messrs. Freeman (chair), Henderson, C. and R. Dinham, Alderman, Wilson, Cane, and Opie (Hon. Secretary).

Cattle Complaint.—Mr. Henderson had a cow in full milk, and apparently in good condition, which will lie down anywhere, and shows considerable disinclination to move. She eats and drinks all right, but is falling away in condition

Business.—It was decided that at each meeting each member should be prepared with a question or notes on some subject suitable for discussion, and that a resolution on such discussion be brought forward.

Bunt.—Mr. Henderson stated that on a paddock cropped this season, after three years' spelling, the Steinwedel wheat was peculiarly affected by bunt. The seed was all pickled, but there is a lot of bunt, the half of the ear facing east only being affected in each case.

Gawler River, November 14.

Present—Messrs. H. Roediger (chair), Hillier, Badcock, Krieg, Day, F. Roediger, and Bray (Hon. Secretary).

Cattle Complaint.—A member reported cows suffering from skin complaint. It first appeared as an eruption nearly an inch in diameter, and seemed likely to increase. It had somewhat the appearance of a ringworm, and caused considerable itching. Mr. Hillier stated that he had had cows similarly affected, but the eruptions disappeared in a few weeks.

Rope from Bindertwine.—Mr. F. Roediger showed machine for making rope out of waste bindertwine. Members thought that this would be useful for farmers, as very serviceable rope could be made from what was now a waste material.

Arthurton, November 14.

Present—Messrs. W. H. Hawke (chair), W. E. Hawke, Crosby, Short, Welch, Lomman, Freeman, Wicks, Rowe, Lamshed, and Palm (Hon. Secretary).

Purchase of Manures.—Members had decided to purchase manures in one lot, to secure best possible terms. An offer to supply 50 tons at a rebate of 2/7 on ordinary price was accepted.

Homestead Meeting.—This meeting was held at the residence of the Chairman, and an interesting time was spent in inspecting the crops and the experimental wheat plots. The crop generally was very promising, and some of the wheats in the experimental plots were showing every indication of yielding well.

Clarendon, December 8.

Present—Messrs. Piggott (chair), A. L. and W. H. Morphett, Pilling, Hilton, Spencer, A. and A. A. Harper, and Wright.

Fruit Fly.—Mr. Pelling read a paper dealing with the possibility of introducing the fruit fly in bananas from Queensland, and urged the necessity for greater care in the inspection of these fruits. After discussion it was resolved that the branches of the Bureau and the fruitgrowers generally should protest against the importation of bananas, as they were not only a source of danger as regards the possible introduction of the fruit fly, but were putting local fruit out of the market.

Naracoorte, November 25.

Present—Messrs. Schinckel (chair), McLay, Forster, Duffield, Wardle, and Caldwell.

Experimental Plots.—The Chairman reported that the experiments he was carrying out for the Department with various manures were a complete failure, the wheats being only 8. in. to 12 in. high. Owing to the dry weather he was late getting the crop in, but the wheat was looking well until the beginning of October. Hot winds, lack of moisture, and frost were responsible for the crop going off badly. Mr. Forster said that though his were not doing so badly, the crops throughout the district were suffering from lack of moisture.

Mount Remarkable, November 13.

Present—Messrs. Jorgensen (chair), Yates, Morrell, Foot, and O'Connell (Hon. Secretary).

Working a Worn-out Farm.—Mr. T. P. Yates read a paper on this subject:—

Professor Towar, in his lecture at Melrose, suggested certain lines of treatment of our worn-out farms, admitting that he could only give theory, as he had no practice in our State. As I have been working on very much the lines advocated by the Professor, my experience will show to what extent he was right in his views. Over 20 years ago I commenced to work an old farm that grew little else than wild oats, having been in cultivation for about 18 years. The growth was so fine and silky that the mowing machine failed to cut more than half the growth. Since then I have sold clean wheat for seed off the same land, and my usual hay crop is 1½ to 2½ tons to the acre, and up to 24 bushels of wheat. This change has been brought about by deep and thorough cultivation, and the addition of humus to the soil. I first divided the land into several paddocks, fallowing portion, and turning in as much of the green stuff as possible. Once when doing this a passer-by told me I was ploughing in a good self-sown crop; my answer was that the land required decayed vegetable matter turned under, and as stable manure was not sufficiently plentiful the next best thing was to plough under the green stuff, as the self-sown crop would only further impoverish the land, and leave it unfit for cultivation next year. The following season I got 2 tons per acre of hay off this piece of land. With stable manure I cart it out as soon as convenient—about March—and spread it so that the weed seeds get a chance to germinate with the early rains, and there is a good growth of green stuff to plough under later on. If the weather is dry when the manure is carted, it is left in heaps—six or seven to the load—as less is blown away, and then in showery weather it is spread. I also usually make a small stack of straw, bringing it as stacked, in a sheltered part of the grass paddock, for the stock. As much as possible is also ploughed under. Cocky chaff is too valuable to be burnt; if not required for stock plough it into the soil. All the land fallowed is ploughed 4 in. to 6 in. deep, care being taken not to leave any ridges between the furrows, and to turn it as much as possible. If the mouldboard clogs up and the land does not work properly I knock off, as shallow ploughing is not advisable. Owing to the limited area of my land I have to crop every other year, which makes the task of growing clean crops more than ever difficult. My land is heavy clay, with Bay of Biscay and sandy patches, being about the most difficult class of soil to keep the oats in check. As to phosphatic manures I have only used them for two years, and as with their use the land produces heavy crops I think it can only be a matter of time for them to exhaust the soil unless we keep up the supply of humus, more than has been done in the past. I notice farmers sometimes borrow a flock of sheep to eat off the green stuff before fallowing; surely it would be better to turn this under and enrich the soil. That my methods of working are not altogether wrong is shown by the fact that the hay crop will go from 1½ to 2 tons per acre this season.

Port Germein, December 13.

Present—Messrs. Blesing (chair), Kingcome, Gluyas, Harvey, Smith, O'Loughlin, Deer, Thomson, and Steinthal (Hon. Secretary).

Business.—Delegates were appointed to attend Conference of branches at Crystal Brook on February 13. Mr. Gluyas read an interesting paper on "Tasmanian agriculture." Mr. Blesing showed sample of Lovelock's Early Wheat, rust being quite distinct on the straw.

Whyte-Yarcowie, December 13

Present—Messrs. Hack (chair), Dowd, Kornetzki, Faul, Mudge, McLeod, and Boerke (Hon. Secretary).

Prickly Pear.—Mr. Mudge tabled sample of so-called spineless prickly pear, or Indian fig. Members thought this should prove a useful fodder for dry districts, as the thorns were very small.

Licensing Stallions.—Members were not in sympathy with the Bill introduced into Parliament last session.

Wheat Experiments.—Members were much pleased with results from Smart's Early Wheat, it having yielded heavier returns than any other variety grown in the district.

Mundoora, December 12.

Present—Messrs. Harris (chair), Blake, Beck, Allen, Shearer, Owens, Tonkin, Aitchison, Loveridge, Mildren, Mitchell, Button, and Gardiner (Hon. Secretary).

Early Moulting.—Several members reported that their fowls had commenced to moult already. Mr. Beck stated his had quite recovered, and had got their new feathers.

Takeall.—The Chairman referred to statement by Mr. Schroeter, of Bute, that fire over the stubble seemed to bring about takeall. His experience was exactly the reverse. In the very early days when straw was worth money an old neighbour always burnt a portion of his stubble each year mainly with a view to prevent takeall. The Chairman said that wherever he found takeall in his crop he carefully noted it, and in the autumn carted old straw or chaff, spread it on the affected spot, and burnt it. This practice had never failed to check the spread of takeall. Members were unanimous that this was a sure remedy for takeall.

Quorn, December 13.

Present—Messrs. Thompson (chair), Cooke, Patten, Walker, Rowe, Herde, Brewster, Altmann, and A. F. Noll (Hon. Sec.).

Water Conservation.—The Chairman read a paper on this subject, urging the necessity for conserving as much water as possible. Farmers should not allow any water from the roofs of sheds, &c., to waste for want of a few lengths of spouting. On nearly every farm there were places where water could be conserved in dams or tanks; those near the homestead were specially convenient for stock, and under some conditions for irrigation. He suggested the construction of octagonal, round, or square tanks, the latter with the corners flat, in places where surface drains could be made to lead the water to them. A trench wide enough to allow a man to work in and to the required depth should first be taken out all round, the sides trimmed, and then filled in with lime concrete, ramming each course well. The concrete can be made of one part good lime to five parts clean gravel, mixed with sufficient water to thoroughly damp the mass. When the concrete has set throw out the earth inside the walls, and put in 6 in. to 8 in. of concrete in the bottom, ramming well. In a few days the tank will be ready for cementing. The first coat should be one of cement to three of good clean sharp sand, and the next coat one of cement to two of sand. Brush the second coat before dry with a folded branbag to give a flat surface, and a couple of days later give a coat of cement wash to fill in air cracks, &c. A tank 15 ft. in diameter and 10 ft. deep will take about three casks of cement. Considerable quantities of water could be conserved in dams by taking the floodwaters off the roads, and blind creeks and watercourses on the farm can be utilized. Even the larger creeks can be dammed and the water diverted to suitable localities, but care has to be exercised in this work. This, of course, all involved a considerable amount of work, but did not require much expenditure. Mr. Cook admitted that it was possible to excavate a square tank more cheaply than a round one, but thought the walls of the former would come inwards as the soil around expanded. In taking out the trench it will be found best when down more than 6 ft. to have two men at work to throw out the soil in two lifts. No trees should be allowed to grow within three chains of the tank. The Hon. Secretary favoured round tanks, built overground of single brick cemented inside and out. Mr. Rowe pointed out that with tanks and dams they were still dependent upon the rain. He suggested that in different parts several farmers should combine to hire a diamond drill from the Government and sink for artesian water. The Chairman pointed out that thousands of pounds had been spent within a radius of 15 miles of Quorn in boring for water. Two ot six bores were flowing, but the water was only fit for stock.

Cherry Gardens, December 9.

Present—Messrs. Burpee (chair), Jacobs, C. and J. Lewis, Partridge, Richards, Hicks, Metcalf, Gardiner, Woods, Potter, Ricks (Hon. Sec.), and one visitor

Annual Meeting.—The Chairman and Hon. Secretary reported on work during the year. Meetings have been held each month, and the average attendance has been 9.5 members. While only two papers were read, the meetings generally have been instructive. The show in March was very successful. The Annual Congress in Adelaide and the Hills Conference at Forest Range had been attended by members. The Chairman urged the advisableness of arranging for a special subject for discussion at each meeting, and also that a resolution should be taken whenever possible after such a discussion to show the general opinion of the members. Officers were thanked, and Mr. E. Wood elected Chairman and Mr. Ricks re-elected Hon. Secretary.

Potatoes.—Mr. Jacobs initiated discussion on the necessity for securing a change of seed, and it was suggested that the members should combine to import 10 tons from New Zealand. Decision on the matter was adjourned, to enable members to make enquiries as to the possibility of carrying out the suggestion.

Koolunga, December 11.

Present—Messrs. Butcher (chair), Sandow, Jose, Atkinson, Butterfield, Noack (Hon. Secretary), and one visitor.

Dairy Cows.—Mr. Kingcome's paper, read at Congress, was discussed. Members generally held that it was possible by judicious feeding to increase both the quantity and quality of milk given by a cow.

Wheat Experiments.—Mr. Butterfield tabled sample heads of Phillis' Marvel, which were greatly admired. The heads were long and well filled. The variety is also said to be rust-resistant. Mr. Sandow tabled sample of wheat of his own selection. This promises to be a good kind.

Stansbury, December 6.

Present—Messrs. A. Anderson (chair), P. Anderson, Faulkner, Jones, Sherriff, Pitt, Henderson, and Cornish (Hon. Secretary).

Standard Sample of Wheat.—It was decided not to send a sample of wheat to the Chamber of Commerce, the members objecting to the method adopted in fixing the standard, and also to the system of docking wheat under the standard, while paying no more for wheat above. The members contended that no inducement was offered to farmers to produce a really first-class sample.

Malting Barley.—Mr. Faulkner tabled sample of barley which was considered of very good quality. Mr. Faulkner spoke highly of the complete harvester for reaping barley, as it saves a lot of labour in cleaning, and turns out a good sample.

Hartley, December 17.

Present—Messrs. Klenke (chair), Hassam, Kutzer, W. and C. Brooks, Wundersitz, and Stein (Hon. Secretary).

Bot Fly.—Mr. Wundersitz tabled specimen of bot fly, and considerable discussion took place on its presence in the district. Several members reported the fly to be rather numerous, and it was not safe to leave the teams without some one in charge, as some of the horses were so frightened of the flies that they would bolt. The eggs were mostly found in the hollow under the jaw, and on the flanks; rubbing the throat and jaws occasionally with a cloth or sponge damped in kerosine was a good remedy, as it would destroy the eggs, and keep the flies away. Members would like to know the best treatment for the bot fly.—[Keep the long hair cut from the parts where the eggs are usually laid, and rub occasionally with soft cloth, damped with kerosine or weak carbolic. Grooming regularly will destroy the eggs.—Ed.]

Saddleworth, December 19.

Present—Messrs. Frost (chair), Daley, Pleuckhahn, Scales, and Coleman (Hon Secretary).

Emerald Rye.—A specimen 4 ft. 6 in. high was tabled by one member, another had it fully 6 ft. high, but laid by the recent storm. This rye stooled well, but appeared liable to shell out when ripe.

Noxious Weeds.—It was decided to have specimens of local noxious weeds exhibited in the Bureau meeting room, correctly named so that members might become better acquainted with them, and know what to destroy.

Rainfall.—The Hon. Secretary reported 3.05 in. of rain this week upon his farm, over 2 in. of which fell within two hours on 16th inst. It was feared a good deal of damage would be done to wheat in the heaps, and hay in unfinished stacks and in stooks. In many places the fallow had been washed away. Sorghum was useful in preventing such wasting.

Davenport, December 4.

Present—Messrs. Trembath (chair), Lecky, Holdsworth, McDonald, Roberts, Hodshon, Magrath, and Pybus (Hon. Secretary).

Poultry.—Discussion took place on cause of poor hatching results during the past season, and it was generally thought that the prevalence of dry windy weather and the absence of moisture was in many cases responsible for the failures. Mr. McDonald read an extract from one of the weekly papers dealing with the prevalence of tick in and about Adelaide, and methods suggested for dealing with the pest. Mr. McDonald generally agreed with the writer of the article, but doubted whether the tick could be so easily combated as stated, as swallows and other birds conveyed them from place to place. Another pest poultry keepers should keep a lookout for was the long grey poultry louse, which would be found on the head of the fowl. If any chicks were noticed to be mopy or drooping they should be carefully examined about the neck and head. Insectibane was the best remedy, as kerosine or carbolic was too strong for the tender skin of chicks. One part of kerosine to two parts oil would be found a cheap and effective insecticide for poultry. Several members referred to the harbour afforded the ticks by the rough bark on the pepper tree (Schinus molle).

Marrem Grass.—Messrs Pybus and Holdsworth reported on failure with marrem grass, which they considered unsuitable for the very dry areas. Nothing seemed so useful as "couch" grass (Cynodon dactylon) for binding the sand in this locality.

Lucindale, December 13.

Present Messrs Tavender (chair), McInnes, Dow, Matheson, Carmichael, and Dutton (Hon. Secretary).

Business.—Mr. Dow stated that parrots were destroying all his fruit. He also asked for remedy for ringworm in calves, and was advised to wash with carbolic dip. The Hon. Secretary stated that he found the disease disappear when stock were turned out on the run; penning up calves together kept it spreading.

Port Pirie, December 13.

Present Messrs. Johns (chair), Hannan, Smith, Welch, Williams, Jose, Spain, Bell, Lawrie, Hector, Wright, and Wilson (Hon. Secretary).

Suggestions from Officers' Conference.—Discussion on report from Annual Congress took place. It was decided to retain the rule re non-attendance, any members absent from three consecutive meetings to be struck off the roll; the annual meeting to be held in January, as it is considered the most suitable time for arranging the annual programme; yearly programme of meetings to be drawn up, and postcards dispensed with.

Koppio and District.—Mr. Wright reported on visit to Port Lincoln district. He was not too favourably impressed with the land available for selection, though settlers with pluck, energy, and capital would probably do well. Manures would be necessary from the start on most of the land.

Minlaton, December 20.

Present—Messrs. Brown (chair), Correll, Teichelmann, Anderson, Newbold, A. McKenzie, Mayar, and J. McKenzie (Hon. Secretary).

Wheat Experiments.—The Hon. Secretary reported on experiments with rust-resistant wheats received from the Department of Agriculture, and tabled samples of each. Gluyas' was much admired, and yielded well, though rather weak in the straw. Gamma came next in yield, but some members who grew it last year stated that it suffered badly from rust. It was decided that different members should grow the various wheats next season, and report results to the Bureau. None of the wheats showed any signs of rust.

Mount Compass, December 13.

Present Messrs. Jacobs (chair). Peters, F. and H. McKinlay, Good, Jenken, Sweetman, Cameron, Hutton, Herring, C. S. and A. J. Hancock (Hon. Secretary), and one visitor.

Sorrel.—Mr. Jenken wished to know the best way to destroy sorrel. [Sorrel is very difficult to dispose of. First do not allow it to go to seed; then in the summer worry it with hoe or cultivator frequently, the hotter the day the more effective the work. It is stated that sorrel will not thrive in soil containing lime. and a dressing of lime might be tried.—Ed.]

Our Implements.—Mr. H. McKinlay read a paper on our implements, and their care. He considered there was plenty of room for improvement in their ploughs. Most of the best makes of hillside ploughs were represented in the district. and while all had good points, none of them was entirely satisfactory for their swamp land. He thought if some of the smaller ploughs were fitted with the mould boards of the larger makes they would improve the work. Then the draught on all of them was from the end of the beam; if fixed to the beam nearly over the point of the share the horse could walk clear of the furrow, and it would be easier to keep the furrows of uniform width. He believed that in the near future light disc ploughs would be used on the swamps. Outside the swamps, he preferred the set-ploughs. Of cultivators they had several good kinds, but the one-horse disc cultivator which could be secured in Melbourne should be a splendid implement. For rough ground. especially if wet or peaty, the flat-tined harrows were best. but for ordinary work. the old style was superior. For single row drills. the Planet Jr. implement was very suitable, but later on they would require small drills with perhaps three hoppers. Wheel hoes were excellent for fine ground: the longer the teeth and the larger the wheels the better. A light horse-roller and levelling harrows were useful; these could easily be made by the orchardist. Sufficient attention was not paid to the care of the implements, the saving in paint and depreciation will more than pay for the cost of a shed for them. Paint or linseed oil should be applied once a year. The wheels should be taken off and cleaned. and the axles greased occasionally. All nuts should be kept tight, and any that are often taken off or slackened should be greased. Coal tar and turps mixed make a good paint for implements. For hand tools. linseed oil cannot be applied too frequently to the handles.

Rhine Villa, December 11.

Present—Messrs. G. A. Payne (chair), F. J. Payne, Farey, Start, W. T. and J. W. Vigar (Hon. Secretary), and one visitor.

Irrigation.—Mr. H. W. Payne sent a paper on this subject. Irrigation was of the utmost importance in dry districts, and was particularly applicable where the land was comparatively level. Some of the most successful schemes in America had been carried out where the rainfall averaged about 5 in. per annum. water being stored in the mountains by means of dams, and conveyed long distances to the irrigated lands. Many places on the Murray Flats had been reported as very suitable for irrigation if the water could be obtained. Not only here, but in many other parts of the States, millions of gallons of water draining from the hills went to waste, and it was a great pity that something was not done to utilize the water. Good authorities state that five acres of suitable soil properly cultivated and manured would, under irrigation, produce enough food for 25 cows. The cost of conserving the water and the suitability of the soil and climate had to be considered; but he believed there were many places where irrigation could be very profitably practised. Mr. Farey thought the ground in this locality too uneven for profitable irrigation; but the Chairman said most farmers could find five acres or more quite level enough; with sufficient water at a reasonable rate five acres were capable of ensuring a fair income to the farmer. The Hon. Secretary read official report on the North and South Rhine Creeks scheme, drawn up in 1888; but members considered the estimates of cost too high. A sufficient amount of water could be conserved at a far less cost.

Mount Remarkable, December 11.

Present—Messrs. Jorgensen (chair), Lange, Foote, G. and T. P. Yates, Grant, Morrell, Casely, and O'Connell (Hon. Secretary).

Currant Growing—Mr. G. P. Yates had grown currant vines for 12 years, but the results were hardly satisfactory, owing to the damage by hot winds, and also by birds in this locality; protection from both was necessary. Mr. Casely grew currant vines, but instead of trellising them he grew them as bushes, the rods being bent and tied to stakes close to the ground. The dense foliage afforded protection against wind and birds.

Wheat Experiments.—Mr. Casely reported sowing World's Wonder, World's Champion, Ranjit, Petatz Surprise, and Dart's Imperial wheat side by side. The two former were failures, but the others did well, Ranjit in particular growing splendidly; it got ahead of and beat even the wild oats.

Manures.—Mr. Casely stated that he got far better result from a dressing of wood ashes than from mineral super. Mr. T. P, Yates's experience was similar, both with wheat, peas, and maize. Mr. Jorgensen and Mr. Lange, who are farming further out on the plains, got better results from super., and attributed the difference to the heavier rainfall experienced nearer the mount.

Reaping Seed Wheat.—The Chairman left the wheat until thoroughly ripe, and stripped on a hot dry day, keeping the beater raised to prevent cracking the grain. He cleaned the seed thoroughly. Mr. Lange agreed with the Chairman; he believed in pickling the seed thoroughly, and not in slumming it, as was often the case. Other members agreed that if properly pickled even infested seed would produce a clean crop.

Mount Gambler, December 13.

Present—Messrs. Mitchell (chair), Dyke, Ruwoldt, Williams, Norman, Wilson, Watson, Barrows, and Lewis (Hon. Secretary).

Rutherglen Fly.—Mr. Williams tabled very young specimens of this insect, and stated that they were collected near Suttontown, where they were exceedingly numerous. Many millions of them could be easily destroyed with very little trouble at this stage.

Pig Feeding.—Mr. Williams read the following extract re alimentary poisoning in swine, from The Veterinary Journal:—"All practitioners know how numerous are the cases of disease in swine, the nature of which remains undetermined even after post mortem examination. Professor Mathis is of opinion that defective feeding is the principal, if not the only, cause. Often in the feeding of swine we have recourse to residuary and next products, and where these are not available, the worst of natural products are often selected. As long as these are quite fresh there is not much to say against their use. Potatoes, which have undergone decay, or putrid fermentation, and cotton seed cake, produce disastrous effects on young swine, and even on adult swine when they enter too largely into the daily ration, or are used for too long a time. Another cause of gastro-intestinal troubles is the use of soda in washing dishes. A number of swine which had eaten the refuse from a hotel showed the effect of soda poisoning. The great danger, however, and one which is rarely thought of, is the deterioration that goes on in food between the time it is prepared and the time of digestion. All vessels used for containing food ought to be thoroughly examined, kept carefully clean, and emptied to the last fragment. The manifestations of these food poisonings are almost always those of gastro-enteritis, associated with nervous disorders, vomiting, inflation, diarrhoea, weakness of the hind limbs, sudden contraction, and convulsions. Diagnosis is very difficult; death may supervene in less than an hour, or may not occur for several hours. Patients which survive the day usually recover, but remain weak for a long time. The best treatment is abundant and repeated evacuating washes with linseed meal water, to which sulphate of soda has been added. A little milk and water ought to be placed within reach of the patient, but all other feeding stopped. until disappearance of the symptoms." Mr. Watson said there was no doubt swine suffered from the unwholesome food they got. Mr. Williams said when swine got weak in the hind legs people usually put it down to ricketts, when it was really defective feeding.

Value of Pure Water.—Mr. Williams referred to the value of pure, clean water for stock. At one time, on the Mount Graham Estate, sheep became "coasty" if kept there for more than five or six weeks. The present owner of a portion of the estate shut off the waterholes, and provided troughs for water, also sulphate of iron and salt for the sheep, with the result that he was now selling fat lambs. Mr. Dyke referred to a place where swamps and waterholes were numerous, and said it was no use providing water in troughs, but Mr. Williams said this objection had been frequently raised. It was found, however, when tried that the stock went naturally to the clean water when they knew it was available; not only did the water of swamps and holes become contaminated, but the stock did not drink as much as they needed to enable them to properly digest their food.

Bot Fly.—Discussion on this subject took place. Clipping the hair from the jaws and fetlocks and rubbing these parts daily with kerosine rag was recommended by Mr. Ruwoldt; Mr. Dyke used kerosine and tar last year, but sulphur and lard seemed more effective, applied every 10 or 12 days to the underpart of the jaws, the fetlock, and also near the eyes.

Port Elliot, December 20.

Present—Messrs. McLeod (chair), Hill, W. E. Hargreaves, Gosden, Inglis, Gray, Nosworthy, Pannell, and W. W. Hargreaves (Hon. Secretary).

Cultivation and Manuring.—Mr. W. E. Hargreaves read a paper on "Cultivating and manuring the farm and orchard."

He was very forcibly impressed with the necessity for conserving in the soil as much as possible of the moisture which falls during winter and spring. In no other way can good crops be secured. The moisture can best be conserved by allowing the rain to penetrate, and by keeping the surface loose to prevent evaporation. When the surface is frequently cultivated the soil beneath will be found quite moist, and the roots of trees and plants have a reserve to draw upon. If a crust is allowed to form moisture is rapidly evaporated, cracks will appear, and the crop must suffer. Some cultivators look on this cracking and drying as unavoidable, but this was a great mistake. It was a very poor soil that will not grow fair crops if well cultivated and manured. Good cultivation not only conserves the moisture and destroys weeds; but it aerates and sweetens the soil. They were told that the microbes which play such an important part in rendering the food in the soil available for the plants required warmth, moisture, and air These conditions were secured by good cultivation. Where land is irrigated this cultivation was equally as important as under other conditions. The greatest benefit from the application of water is only secured when the surface is well worked as soon as it is friable enough. Irrigation without cultivation may do more harm than good. Special care must be taken not to work the soil when too wet, nor to cultivate too deeply when dry, the former will puddle the soil, and the latter practice will cause loss of moisture He could not understand why fruitgrowers should go so far away from market as Renmark and Mildura, and pay such heavy rates for water, when there were thousands of acres of good land in a district like this close to the railway, which were eminently adapted for producing first-class fruit. They had a pleasant and healthy climate, fertile hills and valleys, and also suitable conditions for drying. If there is a market to be found for fruit this district can produce it in tons It was a mistake to think that only the rich land would grow good fruit. What was often termed second and even third rate land with good cultivation and manuring can be profitably utilized. Land that will grow fairly good fruit without any manure will pay well to manure. Well-rotted stable manure was the best of all; it should be ploughed in about June or July. Fresh wood ashes can be applied in large quantities with good results. Where stable manure is not available use some commercial fertiliser; he had very good results from bonedust. The quantity to apply will depend upon the character of the soil and the age and condition of the trees. Organic matter or humus was very necessary; stable manure supplied this. Green crops, such as peas, barley, &c., ploughed under also add humus and enrich the soil. Many soils contain plenty of plant food, but it is not available; the addition of organic matter will almost always remedy this. Good drainage was indispensable;

it was false economy to plant on land that was not drained. The question of irrigation was of utmost importance, especially in respect to individual effort. There were numerous small streams of water now going to waste that could be profitably utilized. The beginning may be small, but it should be undertaken wherever the surroundings are favourable. Fruit, produce, green stuff, &c., can be produced, more stock kept, and more success generally achieved where irrigation can be practised in this way. He knew of no subject on which there was greater diversity of opinion than that of the method of applying water to the land. The irrigator would have to study the various methods carefully, and decide which was most suitable to his particular circumstances. Port Elliot was the centre of an important district, possessing many great natural advantages, and they could grow almost as great a variety of crops as any other district in Australia. To secure success, however, the farmer must work on a definite system, adapt his practices to circumstances, and know what pays and what does not. How many of them kept proper account books? Did they watch each individual cow and cull out the unprofitable ones? Were the pigs, sheep, and fowls watched sufficiently to know whether they were paying?

Good discussion ensued. Mr. Gray advocated summer fallowing in this district; he had secured 10 bush., per acre more from land treated in this way than from adjoining land ploughed up just before seeding. Mr. McLeod stated that a neighbour had a good crop of wheat this year on a paddock that had been cropped for quite 30 years; the land was manured w'th a mixture of 80 ℔. mineral super. and 30 ℔. dry ashes per acre.

Homestead Meeting.—This meeting was held at Mr. Nosworthy's residence, the usual inspection of stock &c., taking place. The breeding sows and young pigs, which had the run of a paddock of peas, looked well, and the herd of milking cows, about 30, were much admired.

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INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of persons registered and found employment by Government Departments and Private Employers from November 29 to December 24, 1902.

Trade or Calling.	Number Registered. Town.	Number Registered. Country.	Number Employed.
Laborers and youths	85	159	271
Masons and bricklayers	—	—	2
Carpenters	3	—	—
Painters	1	—	2
Plumbers and ironworkers	—	—	1
Boilermakers and assistants	—	—	1
Blacksmiths and strikers	1	—	—
Fitters and turners	1	3	—
Moulders	—	1	—
Engine drivers and firemen	—	1	—
Pipe jointers	—	—	3
Crane driver	—	—	1
Shipwright	—	—	1
Sail and tent makers	—	1	1
Saddler	—	1	—
Compositors	3	—	—
Apprentices	3	2	—
Cleaners	1	1	—
Porters and junior porters	5	1	2
Rivet boys	1	—	—
Totals	104	170	285

December 24, 1902.

A. Richardson, Bureau Clerk.

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FARM HINTS FOR FEBRUARY.

By A. Molineux

Farmers who are troubled with drift sand should sow barley, rye, buckwheat, sulla, lucerne, rape, or any other seeds that will grow on the drift. The most important thing afterwards is to keep sheep in particular and all other stock in general off the sand. Sulla is Hedysarum coronarium, and is known also as French honeysuckle and Malta clover. Each plant may produce 30 to 50 lb. of green fodder at the end of autumn each year. The seeds should be scalded and kept in wet bagging until they swell; then sow 1 in. deep at 18 in. apart.

It is most important that some early green feed should be provided for late autumn and early winter feeding of farm stock, and more especially for ewes. The dry grass becomes scarce, innutritious, and is beaten into the dust by the rains, and there is next to nothing for the sustenance of the animals. Some of the stubble land, or a portion of the fallow, should be harrowed or scarified after sowing 3 lb. each of dwarf Essex rape and white mustard, or some rye or barley should be sown. These seeds will spring up with any other seeds that may already be upon the ground, and soon there will be a substantial bite for the animals.

By cultivation of the soil the air, warmth, and moisture are admitted below the surface, and the nutrifying agencies are stimulated to the greatest activity. This beneficial work can be greatly aided by the raising of leguminous crops upon the land. Blue and yellow lupins, sainfoin, sulla, lucerne, Bokhara clover, and many other legumes can be grown upon sandy soils, and still more of them upon the better class of land. Most of the legumes provide a deal of wholesome fodder. Seeds of these should be sown during this and next two months—the sooner the better. It is bad work to grow two cereal crops in succession on the same land, but it is beneficial to follow a cereal with a leguminous or a root or leaf crop. Tares and vetches make valuable pasturage.

Late fallow is often a failure, because the subsoil is broken into big clods, which keep the seed bed hollow for longer than a year. Plants do very well so long as rain falls at short intervals; but when the plants are well developed and rain ceases, the soil dries completely about the roots, and "take all" is charged with "blighting" of the crop. At the same time the nutrifying and dissolving agencies in the soil cannot exercise their full powers, and there is naturally less plant food immediately available for the succeeding crop.

Where there is a piece of rich moist soil, or where irrigation is possible, a few acres of maize can be sown with every promise of a crop. It must be sown in rows that will allow of the horse hoe being frequently used to keep the surface loosened up, but not to a greater depth than 3 in., lest the roots be destroyed. Soak the seed before sowing. Any kind of sorghum, andropogon, or panicum may also be tried.

Keep the hoe going between the rows of beets and mangolds. If water can be supplied it will be all the better, and a mulch of farmyard manure will develop size in the bulbs. Small roots are more nutritious than large, but bulk may sometimes compensate for absence of a proportion of quality. Do not remove many of the leaves, because that will injure the roots. Do not feed too heavy a ration either of leaves or roots to stock at first, as they are liable to scour at first. Any surplus of crop can profitably be utilized by chaffing in alternate foot deep layers with good chaffed straw in the silo pit.

The fact has been established that young green sorghum sometimes causes the death of cattle, but this occurrence is very rare. Sorghum and maize are at their best when the seeds are beginning to glaze or harden. This gives the farmer an opportunity to secure a good crop of seed or corn and a heavy crop of valuable fodder, which can be chaffed into the silo pit if it cannot be used at once.

Lucerne fails to grow in some places because it is sown at the wrong time The right time in one locality is the wrong one in another. If a locality is subject to early and severe night frosts it will be necessary to sow the seed in October, after danger of frost is over. In mild, frostless regions it will be well to sow during February or March. Lucerne will grow fairly well in many unsuspected situations, but the best places are where there is a deep, rich alluvium, with water below at a depth of not more than 14 ft The soil must be pulverized fine to a fair depth, and made as fine and level as possible on the surface. The seed should be drilled in to a depth of not more than 1 in., in rows 1 ft. apart. Roll the land at once. When the plants show well above the ground run light harrows across the rows to loosen the surface. Get seed grown in New South Wales if possible, and sow 12 lb. per acre.

Prepare some land at once for sowing peas for pigs and profit. Some superphosphate or Bally bonedust will be useful to the crop, as well as to that which follows. Seed should be drilled in during the next 10 weeks, commencing in March and finishing in May.

Plant potatoes in rich, well-prepared ground. The plough can be used in this work, turning over 6 in. deep, planting the sets at a foot apart in each third furrow. Bone powder or superphosphate and a readily soluble potassic manure will benefit the crop. Keep the soil well worked between the rows, but do not hill up. If farmyard litter can be spread between the rows when the plants are 8 in. high it will be found useful.

Pastures in the hilly and cooler districts should be prepared and planted with a liberal mixture of grass seeds, clovers, and similar plants. The greate the variety of nice and nourishing plants there is in a pasture the more healthy and strong will be the stock living upon it. The soil should be well prepared, and directly after sowing the seed the field should be heavily rolled to place the soil and seed into close relations. When the plants show up well the harrows should be put on to let in a little air, warmth, and moisture.

RAPE.

By J. D. Towar, Principal Roseworthy College.

This is a plant belonging to the same botanical family as the turnip, and in its manner of growth, as well as its appearance, it is easily mistaken for the flat turnip, except that it does not develop a fleshy root. The rape is grown largely in Germany and France for the production of rapeseed oil, although it is supposed to have originated on the coasts of Holland and England. The seeds contain from 33 to 43 per cent. of oil, which, when freed and refined, is used for lamps, lubricating machinery, and for adulterating almond and olive oils. Rape seed cake, a by-product of the oil manufacture, is used as cattle feed.

To the South Australian farmer, however, it promises of value more as a feed in the green state for sheep, hogs, and cattle, as a green manure, and as a means of cleaning the land of weeds. Whether it will grow in all parts of the State will have to be determined by actual trial. That it is fairly hardy, and will make considerable growth even on poor soil and with very slight rainfall, has been proven beyond a doubt; while in some parts of the State it is already being grown to a considerable extent. A seeding made at the College this year on July 3, with the very unfavourable conditions of weather following, yielded a fair crop, which would have been most excellent feed all through October, November, and December. Other seed sown with sorghum on October 3, although not a satisfactory growth, is now (January 23) good feed, and growing splendidly.

Unlike many new crops, rape seed is quite cheap, it requires only three or four pounds per acre, and can be grown with little or no care. It is partial to low moist land, although it will do well in any soil. It is capable of enduring a severe frost, and when once started will persist in growing through extremely dry weather. In this climate it can be sown at any time, though greater success will be expected if sown during May, June, and July, when there is most likely to be sufficient moisture to germinate the seed, and give the plants a start.

The report has come to me that it is being successfully grown in the hills districts by sowing in the phosphate with the wheat. In this case it is expected to make but scanty growth while the wheat is growing; but as soon as harvest is over, the rape takes possession of the ground, making a vigorous growth, supplying an abundance of feed for the following months. If the above practice is successful, the rape ought to crowd out all noxious weeds, and if not needed as pasture, would make a valuable green manure.

That rape is a success as a forage crop has been proven beyond a doubt. It is especially valuable for sheep. Hogs do well on it, and with a small addition of grain will fatten on it quite readily. It helps in assimilating the grain feed by distension of the digestive organs. Cattle relish it, and can be pastured on it freely, provided they are turned into it a few times at first for a short period only, and preferably when they have had a liberal feed of dry forage. This precaution is equally important with sheep and lambs, and is not more imperative than the general practice to be followed in turning hungry stock into fresh, green feed. The stock should simply be introduced to it slowly and with care. There is slight danger of tainting the milk, but this can be prevented by feeding it just after milking.

As a catch crop, the rape suggests itself favourable to sowing in the wheat either at the time of seeding or about six weeks later, when it is perfectly safe to cultivate the wheat with a spike-tooth harrow. It also appears reasonable to sow it on the fallows at the first scarifying. It can be drilled in rows about 16 inches apart, or sown broadcast. It requires but little covering.

Some enormous yields are reported. One in Canada of 27 tons of green feed from 2 lb. of seed; 36 tons from one acre in two cuttings. A variety of March seed from France produced, without fertiliser or irrigation, in Southern California, a climate similar to this, plants which grew 3 to 3½ ft. high, yielding 32 tons of green feed per acre; while another experimenter reports that 40 acres furnished sufficient pasturage for 666 lambs for from two to two and a half months.

Under favourable conditions the rape will withstand being pastured off several times. And were one to grow it extensively as a forage crop it would be best to have it in two or three fields, and allow one to grow while the other is being eaten off. Never allow the stock to eat anything more than the leaves.

In purchasing the seed insist on getting the Dwarf Essex or Dwarf Victoria variety. The Bird seed rape, as seeds, looks exactly like the Dwarf Essex and Victoria, but it has little or no value as a forage crop, and is to be carefully avoided.

Rape is not considered good for horses, and is of value neither as dry forage nor silage.

DEPARTMENTAL NOTES AND WORK.

During the month 13,628 cases, consisting of 21 distinct kinds of fruits, have been certified at Adelaide for export to New South Wales and Victoria. These consisted chiefly of plums, apples, peaches, tomatoes, and apricots. Of these 6,989 cases, or equal to 175 tons, were plums sent to Melbourne jam makers owing to the great shortage in the Victorian plum crop. During the same period 3,201 packages of vegetables and four parcels of plants were passed to Broken Hill. The inspectors admitted 3,919 cases of fruits and 18 packages of plants into the State during January. Fifty-nine crates of bananas were refused admission owing to their overripe condition on arrival.

During the month ending January 24 the inspectors under the Vine, Fruit, and Vegetable Protection Act have been engaged as follows:—Mr. Brown has been kept very busy in connection with the examination of imported and exported fruits and plants. In the Stanley districts Inspector Kelly has been inspecting eight and a half days, and has visited 44 orchards, besides supervising the spraying tests conducted for the department in that locality. In Barossa and adjoining districts Inspector Trimmer has visited 214 orchards and gardens in the 27 days engaged. He has also attended to the test plot at Angaston. In the Mount Lofty Ranges Inspector Monks has spent 16 days inspecting 214 gardens. At Coonawarra Inspector Pounsett has been active in detecting codlin moth infected gardens. Many of the orchards in the Coonawarra Fruitgrowing Colony are as yet apparently free of this pest, and those owners having affected trees are, with few exceptions, spraying and using other precautions to suppress it. In the township of Penola the old cottage gardens are likely to give trouble, but these will be dealt with promptly in future. Mr. Pounsett has also been instructed to detect any illegal importations of plants from Victoria if possible, as the department is determined to prosecute any person who may engage in such practices.

During the past month Professor Perkins, accompanied by Mr. Quinn, visited the orchards of Messrs. Hannaford and Maughan at Houghton, and Dall at Clare, in which are being conducted the departmental codlin moth tests. He was impressed with some of the results, that already bore testimony to the efficacy of arsenical spraying. It is fairly apparent, however, that in some instances those who have been good enough to place their orchards at the disposal of the department are not yet sufficiently imbued with the fact that experiments, however successful, will only carry weight with the general public so long as every effort is made to eliminate causes of error. In this connection the necessity of keeping a careful and accurate record of everything, however apparently trivial, cannot be too strongly urged. As a case in point, it may be stated that it is hardly possible to keep an accurate record of fallen apples if pigs are allowed free access to the orchard.

Professor Perkins also visited some of the Clare and Auburn vineyards and cellars. It may be stated that it is not long since that these favoured districts could boast of the best tilled vineyards in the State. It is a matter of regret to notice that in this direction their zeal appears to have cooled down somewhat. In many vineyards, once the pride of the districts, evidences of neglect are only too painfully apparent. Heavy December rains would appear to be the excuse generally advanced for this regrettable state of affairs. To our mind they offered the opportunity for which we had long been looking, to get the ground in a good state of tilth and free from weeds.

During January Mr. Quinn has visited orchards at Strathalbyn, Balhannah, Forest Range, Summertown, Piccadilly, Belair, Chain of Ponds, Houghton, Clare, Penwortham, Auburn, Angaston, Nuriootpa, and Tanunda, in connection with various phases of horticultural instruction. The blocks in which the spraying tests for codlin moth are being carried out have been visited, and the progress of the work noted. In all cases the effect of the spray is apparent. The occupiers, with the exception of Mr. Schantz, at Piccadilly, have carried out the instructions regarding the number of sprayings. In some instances the exact attention paid to collecting the fallen fruits has not been too close, but this is being remedied. Mr. Quinn says the fine quality and freedom from scab or codlin moth of the export varieties is very gratifying. In the Angaston district the Dunn's Seedling and Cleopatra varieties are yielding crops of particularly fine quality. While in the Tanunda district he visited the running shed made by Mr. Hoffmann for protecting his drying ground from dew or rain. He hopes, with the owner's consent, to write an illustrated article on the subject at an early date.

During the past six weeks large quantities of commercial fertilisers have arrived from oversea ports, while the principal local manufacturers have been busily employed. Mr. Summers, the Inspector of Fertilisers, has taken samples of 14 different shipments, two of which were landed at Wallaroo, besides having visited local works at New Thebarton, Port Adelaide, and Wallaroo. The results of the analyses of these samples will probably appear in the March issue of the Journal. Mr. Summers has also paid a visit to Rhine Villa, on the invitation of the local Agricultural Bureau, for the purpose of addressing a public meeting on the use of fertilisers.

The Dairy Instructor (Mr. G. S. Thomson) has returned from Europe, and has taken up his duties again in this State. At present Mr. Thomson is engaged in writing a report of his visit to Europe and America, and this will probably be published in the Journal at an early date. Arrangements will be made to utilize Mr. Thomson's services as much as possible in the dairying centres.

During the next two months a number of Conferences of the Branches of the Agricultural Bureau will be held. At Brinkworth, on February 11 and 12, the Northern Yorke's Peninsula Conference will be held; the Northern Branches will meet at Crystal Brook on February 13; River Murray Branches at Mannum on February 25 and 26. The Conference of Southern Branches is to take place at Strathalbyn on March 26, and the South-Eastern Conference is to take place at Mount Gambier on the same date. Members of the respective Branches should make every effort to attend these meetings.

CORRESPONDENCE.

[In this column we propose to answer questions of general interest, and also to make selections from our official correspondence. Questions dealing with matters of interest mainly to the writer will be answered direct. Correspondence invited. Ed.]

RINGBARKING FOR CURRANTS.

"Angaston."—From my point of view ringbarking induces almost a state of disease in the plant, whereby heavier fruiting is obtained. Usually in such cases maturity of the fruit shows a tendency to advance, hence earlier colouring. But, in view of their smaller bulk, fruit from plants not ringbarked are probably able ultimately to ripen first.—(A. J. P.)

PLANTS FOR IDENTIFICATION.

"W. H. M."—It is not possible to identify the specimen you forward, as the leaves are all broken and flowers missing. When sending plants for identification they should be pressed for a day or two, taking care to spread out several of the leaves so that they do not get broken. Flowers, and if possible seed vessels, should always be sent. With small plants the whole specimen may be sent; of larger growths a branch with leaves, flowers, and seeds will be sufficient. Send by post between sheets of thin cardboard. A duplicate should always be kept, and the name attached for future reference.

WHITE EYES IN CATTLE AND HORSES.

"C. E. B."—The treatment recommended for complaint known as "white eyes," i.e., when a white spot appears on the eye, extending until a white skin obscures the vision, is as follows:—Bathe the eyes frequently with hot water, and twice a day apply by means of a scent squirt some opium lotion made by dissolving 4 oz. tincture of opium in a quart of warm water. Keep a damp bag over the eyes until they improve, and if possible keep the animal in a cool, dark stable. This complaint appears to be decidedly contagious, and affected animals should be isolated. Flies will convey infection.

DEHORNING CALVES.

"J. A. H."—Horns on calves can be prevented from growing by the following treatment:—When the calf is about a week old clip the hair from round the "button," as the embryo horn is called, moisten the part and apply a little caustic potash. Care must be taken that the skin around the button is not burnt, and that too much of the caustic is not applied. Another practice is to remove the button before it becomes attached to the head of the calf. This is done with a sharp knife or a special gouge, usually when the calf is 10 to 14 days old.

SOFT RIND BACON.

"Mount Bryan East"—In reply to your enquiry re method of curing bacon that will keep the rind soft, an authority on bacon curing expresses the opinion that the hardness of the skin is not due so much to the curing as to the fact that many farmers do not understand how to take away the rough salt. He suggests that immediately after curing the rough salt should be washed off, and the bacon soaked in fresh water for a couple of hours; then, immediately on removal, scrape the rind carefully, avoiding cutting, and hang until sufficiently dry for smoking. At no time should it be left where the rind will become hard and perished.

EXPERIMENTS WITH FERTILISERS FOR WHEAT CROPS.

By W. L. Summers, Inspector of Fertilisers.

Portion of the amount voted by Parliament for experimental cultivation was devoted to a series of tests of fertilisers for wheat crops. In this series there were practically two groups—those in the dry areas, viz., Quorn, Elliston, and Purnong; and those in districts where the rainfall is usually more reliable, viz. at Paskeville, Eudunda, Wasleys, Naracoorte, Reynella, and Lipson. In each case in the latter series ten different lots of manure supplied by the department were tried, and in the former only seven. The objects of the tests were to demonstrate (1) the effect of different kinds of phosphatic fertilisers, (2) the effect of different quantities per acre, (3) the effect, if any, of the addition of nitrogen, (4) the effect of concentrated super as compared with an equivalent value of ordinary super, and (5) the effect of citrate-soluble phosphate as compared with water-soluble phosphate in super. In the drier districts Thomas phosphate was omitted from the tests. Except where owing to local conditions fallowing is not practised it was stipulated that the tests were to be carried out on clean fallow land. Each plot was from 2 acres to 2½ acres in area.

Where possible manures of local manufacture were supplied to those carrying out the experiments, and samples of each were taken for analysis. Unfortunately for one of the objects of our tests the guano super supplied by the Adelaide Chemical Works Company instead of containing about 16 per cent. water-soluble phosphate and 15 per cent. of citrate-soluble, contained nearly 30 per cent. of water-soluble phosphate, and only 3 per cent. of citrate-soluble, so that the plots with guano super which were arranged to see what effect the citrate-soluble phosphate in mineral phosphates would have on the wheat were useless for this special purpose.

ANALYSES OF MANURES.

	Water-soluble Phosphate. per cent.	Cit.-soluble Phosphate. per cent.	Acid-soluble Phosphate. per cent.	Nitrogen. per cent.
1. Mineral Super	39	2	—	—
2. Guano Super	28	3	—	—
3. Concentrated Super	95	5	—	—
4. Bone Super	14.5	20	8	2.5
5. Mineral Super and Bone Super Mixture	24	11.5	17	2
6. Mineral Super and Sulphate of Ammonia	39	2	—	3.2
7. Thomas Phosphate	--	26	15	--

The percentage of citrate-soluble phosphate in the Thomas phosphate is not the result of an actual analysis of the particular lot used in these experiments, but is the lowest of a number of analyses of the same brand made during the past two years. In dealing with the results, the citrate-soluble contents of Nos. 1, 2, and 3 can be disregarded as the amounts are so small; the percentage of acid-soluble phosphate in these was not ascertained, as being purely mineral phosphates they would not have any value under our conditions. The manures may be roughly divided into three groups, viz.:—(a) Water-soluble phosphates, as Nos. 1, 2, 3; (b) nitrogenous supers, as 4, 5, and 6; and (c) those containing a considerable percentage of citrate-soluble phosphate, as Nos. 4, 5, and 7.

RESULTS OF EXPERIMENTS.

The following tables give the yields of the different plots, the increase due to manure, and the profit on same. In estimating the financial position Adelaide prices for manure are taken as a guide, and 5/ a bushel net allowed for the wheat. In ordinary years the profits would be barely half, as the average price would be from 2/6 to 3/ per bushel.

QUORN.

Mr. A. F. Noll reports a total failure; owing to the severity of the season practically nothing was reaped on any of the plots.

PURNONG—MR F. H. BAKER.

Land, a white sand, on the north side of a large, high sandhill. A bar of limestone rubble runs right through the plots, which were laid out so as to get as nearly as possible the same aspect, and an equal amount of the patch of rubble. Land was ploughed about end of July, 1901, worked crossways with disc cultivator and harrowed once. Thirty pounds per acre of Dart's Imperial Wheat sown at end of April, there being insufficient moisture to cause germination until after it had been in the ground for some time. The season right through was very dry, only light showers being experienced, and these were not sufficient to moisten the subsoil. Late frosts, and hot winds as the crops were coming into ear, reduced the yields considerably. The total rainfall from seeding to harvest was just over 5 inches.

No. of Plot.	Manure per acre.	Yield per acre.		Cost of Manure per acre.		Increased Yield per acre due to Manure.		Profit per acre over unmanured plot.	
		bus.	lbs.	s.	d.	bus.	lbs.	s.	d.
1	84 lbs. Mineral Super ...	5	42	3	3	5	6	22	3
2	112 lbs. Mineral Super ..	6	18	4	4	5	42	24	2
3	140 lbs. Mineral Super .	6	10	5	5	5	34	22	5
4	84 lbs. Guano Super ...	5	23	3	0	4	47	20	11
5	84 lbs. Bone Super ...	5	25	4	0	4	49	20	1
6	No Manure	0	36	—		—		—	
7	44 lbs. Concentrated Super ...	5	16	4	8	4	40	18	8
8	84 lbs. Bone Super and Mineral Super Mixed	5	1	3	6	4	25	18	7

It will be seen from the above that there is not a great difference in the yields of the manured plots. The return from No. 3 is lower than No. 2, but

Mr. Baker states that there was more of the rubble patch in this than in any other plot, and as on the rubble there was scarcely any crop at all the difference is readily accounted for. Plot No. 8 being the lowest suffered most from late frosts, which were very severe. The unmanured plot was fully a week later in maturing than the manured plots. This land was last in crop four years ago, and did not yield a bushel to the acre, and on that occasion the best crop was on the rubble patch. Manures appear to be useless on such land, the wheat blighting badly with the hot winds. While the above results demonstrate that manuring is necessary and profitable, even in the dry areas, nothing much can be gleaned as to the effect of the different dressings, as the use the plant could make of the manure was evidently controlled to a very large extent by the absence of moisture.

LIPSON—MR. S. F. POTTER.

Free red sandy loam, fallowed in August, 1901, and worked to fairly fine tilth with cultivator in September. Seed was sown on May 27, 1902, land being fairly moist and a good tilth secured; sufficient rain to germinate the seed fell four days later; 37 lb. per acre of Silver King Wheat were sown. The season throughout was rather dry—8½ inches from seeding to harvest—but was mild and free from drying wind. September and October, the critical period, were remarkably favourable. Crop harvested on December 24, but the wheat was fit to strip ten days earlier, heavy rains delaying operations. No damage was done by the storm, the wheat being strong and healthy.

No. of Plot.	Manure per acre.	Yield per acre.		Cost of Manure per acre.		Increased Yield per acre due to Manure.		Profit per acre over unmanured plot.		
		bus.	lbs.	s.	d.	bus.	lbs.	£	s.	d.
1	84 lbs. Mineral Super ...	19	16	3	3	15	54	3	16	3
2	112 lbs. Mineral Super ..	26	46	4	4	23	24	5	12	8
3	140 lbs. Mineral Super ..	27	4	5	5	23	42	5	13	1
4	112 lbs. Bone Super and Mineral Super .. .	20	8	5	6	16	46	3	18	4
5	200 lbs. Mineral Super ..	27	50	7	9	24	28	5	14	7
6	140 lbs. Thomas Phosphate	12	55	4	6	9	33	2	3	3
7	84 lbs. Thomas Phosphate ...	12	0	2	9	8	38	2	0	5
8	112 lbs. Super and Sulphate of Ammonia . ..	22	2	5	6	18	40	4	7	10
9	44 lbs. Concentrated Super ...	22	2	4	8	18	40	4	8	8
10	No Manure	3	22	—		—		—		
11	84 lbs. Guano Super ..	18	30	3	0	15	8	3	12	8
12	84 lbs. Bone Super ..	15	29	4	0	12	7	2	16	7

The above is a striking testimony to the value of water-soluble phosphate, and again demonstrates that we can apparently get no benefit from the use of nitrogen. Mr. Potter states that the tallest growth was on plot No. 8, and that plot No. 12 made the most rapid growth at the start; but as seen from the table the returns were not equal to super alone. The manures applied to these two plots contained nitrogen. The citrate-soluble phosphate also appears comparatively ineffective; plots 4, 6, 7, and 12 all contain more or less of this form of phosphate. Plots No. 6 and 7 had no water-soluble phosphate, and yielded the least of any of the manured plots. No. 12, which also had a small quantity of water-soluble phosphate, gave 3½ bushels more than No. 7; while No. 4, which consisted of 24 per cent. water-soluble phosphate and 11 per cent. citrate, shows a marked increase. It is, however, 6½ bushels behind the plot receiving an equal weight of manure with 39 per cent. water-soluble phosphate, viz., No. 2. This latter plot did not carry nearly as much straw as Nos. 3, 5, and 8, but the yield was most satisfactory. Comparing No. 8 with No. 2, it would seem that the sulphate of ammonia simply caused more flag at the cost of grain. No. 11 is another illustration of the effect of the water-soluble phosphate. Compare it with No. 12. There is an increase of 3 bushels per acre in the yield, and while the total phosphate in each is nearly the same, No. 11 is almost entirely soluble in water. Compared with plot 7, the difference is still greater, yet the total amount of phosphate applied to No. 7 was one-fourth more than was applied to No. 11. Mr. Potter states that the plots manured with Thomas phosphate grew very slowly, and were fully a week later in ripening than the other manured plots, while No. 10 was three or four days later still. There was little, if any, difference in the quality of the grain from the different plots. Mr. Potter is to be congratulated on the wonderful results secured from plots manured with super, and when it is remembered that of the 8¼ inches of rain recorded, over an inch fell too late to affect the crops the high returns are indeed surprising.

EUDUNDA—MR. A. KLUSKE

Soil, loam, limestone, and Bay of Biscay ground, fallowed early, scarified and cross harrowed; 45 lb. Purple Straw Wheat per acre, sown on May 14 and 15. Rainfall from seed to harvest 7¼ inches; the season was characterized by long spells of dry weather, and the rains were very light, and failed to penetrate to any depth. Heavy rain in December, when crop was just fit to harvest did some damage.

No. of Plot.	Manure per acre.	Yield per acre.		Cost of Manure per acre.		Increased Yield per acre due to Manure.		Profit per acre over unmanured plot.	
		bus.	lbs.	s.	d.	bus.	lbs.	s.	d.
1	84 lbs. Mineral Super ..	7	55	3	3	4	11	17	8
2	84 lbs. Thomas Phosphate ...	4	43	2	9	0	59	2	2
3	84 lbs. Guano Super ..	7	34	3	0	3	50	16	2
4	84 lbs. Bone Super ..	6	47	4	0	3	3	11	3
5	112 lbs. Mineral Super .	7	23	4	4	3	39	13	11
6	44 lbs. Concentrated Super	7	10	4	8	3	26	12	6
7	No Manure	3	44	—		—		—	
8	112 lbs. Mineral Super and Sulphate Ammonia ..	10	4	5	6	6	20	26	2
9	140 lbs. Thomas Phosphate...	5	55	4	6	2	11	6	5
10	140 lbs. Mineral Super ..	10	15	5	5	6	31	27	2
11	112 lbs. Slack Lime ...	4	46	..		1	2	—	

Although the whole of the plots showed to a marked degree the effect of the scanty rainfall, the results from the super plots are fairly satisfactory. Thomas phosphate is again a failure, and while No. 4 shows a marked improvement on No. 2, it is more than a bushel below No. 1, with the same quantity of phosphate, all soluble in water. It will also be seen that where 1 cwt. lime was applied better results were obtained than from the use of ¼ cwt. Thomas phosphate; this result again raises the question as to how much of the result of Thomas phosphate applications under our conditions is due to the lime it contains. The highest return, and also the greatest profit, is secured from plot 10, with the heavy dressing of super. The position of plot No. 8 is surprising, as apparently in this instance the nitrogen has been of some benefit—compare with plot 5. The concentrated super (plot 6) has yielded almost as well as the equivalent amount of ordinary super (No. 5). Apparently the yields have been somewhat affected by the variations in the soil, as plot 1 gives more wheat than plot 5, which received one-third more manure; yet plot 10, receiving two-thirds more, is considerably better than No. 1, the same kind of manure being applied to each plot.

MALLALA—MESSRS. J. S. & A. L. CHURCHES.

Plots on good red sandy soil, fallowed early, scarified twice and harrowed; one bushel per acre of Smart's Pioneer wheat drilled in on May 6, 7, and 8, the land being in good order and moist. The weather was wet about seedtime, but considerably dryer than the average throughout the winter. Crop harvested on November 24 to 26. Rainfall from seeding to harvest, about 9 inches.

No. of Plot.	Manure per acre.	Yield per acre.		Cost of Manure per acre.		Increased Yield per acre due to Manure.		Profit per acre over unmanured plot.		
		bus.	lbs.	s.	d.	bus.	lbs.	£	s.	d.
1	84 lbs. Mineral Super ..	17	45	3	3	11	45	2	15	6
2	84 lbs. Thomas Phosphate ...	10	15	2	9	4	15	0	18	6
3	84 lbs. Guano Super ..	14	0	3	0	8	0	1	17	0
4	84 lbs. Bone Super .	16	0	4	0	10	0	2	6	0
5	112 lbs. Mineral Super ...	21	15	4	4	15	15	3	11	11
6	44 lbs. Concentrated Super ...	15	15	4	8	9	15	2	1	7
7	No Manure	6	0	—		—		—		
8	112 lbs. Mineral Super and Sulphate of Ammonia ...	16	30	5	6	10	30	2	7	6
9	140 lbs. Thomas Phosphate ..	12	0	4	6	6	0	1	5	6
10	140 lbs. Mineral Super ...	24	45	5	5	18	45	4	8	4
11	112 lbs. Bone Super and Mineral Super Mixed	18	0	4	8	12	0	2	15	4

These results emphasize the demand of the wheat crop for the water-soluble phosphate. Compare plots 1, 2, 3, 4. In this instance No. 4 occupies a relatively better position than in most of the tests. The heavier dressings of super show a marked increase in the yields. Comparing plots 8 and 10 with plot 1, we see that in plot 8 the additional quarter cwt. of manure gives 3½ bushels extra, and the half cwt. in No. 10 7 bushels extra. The concentrated super gives a considerably smaller return than the corresponding amount of mineral super (plot 5). Thomas phosphate again compares badly with mineral super; comparing plots 1 and 2, it gives 7½ bushels per acre less with equal quantities of manure. Comparing plots 9 and 5 with practically the same value of manure, the difference is 9¼ bushels against the Thomas phosphate.

PASKEVILLE—MR W. S. O'GRADY.

Sticky clay loam, of a grey colour one end and with red gritty soil across the other end. Land fallowed early in June, 1901, harrowed and cultivated in August, and twice cultivated before drilling. A fine tilth was secured, though the bottom was hard, and seed was sown on May 20, the soil being dry to dustiness. Seed did not germinate until first week in June, when 3 inches of rain fell. The weather following was cold and dry, and the crop made little progress until the warm weather came. The straw, except in the solid ground and where flooded, was short and poor, and until late in the season looked as if it would be a failure. About 6½ inches of rain fell between seeding and harvesting on December 6. Three years ago this land was cropped and manured with 74 lb. per acre of mineral super, the yield being 20 bushels per acre.

No. of Plot.	Manure per acre.	Yield per acre.		Cost of Manure per acre.		Increased Yield per acre due to Manure.		Profit per acre over unmanured plot.	
		bus.	lbs.	s.	d.	bus.	lbs.	s.	d.
1	84 lbs. Mineral Super ...	13	47	3	3	6	27	29	0
2	84 lbs. Thomas Phosphate ...	9	4	2	9	1	44	5	11
3	84 lbs. Guano Super ..	13	4	3	0	5	44	25	8
4	84 lbs. Bone Super ...	10	24	4	0	3	4	11	4
5	112 lbs. Mineral Super ..	14	28	4	4	7	8	31	4
6	44 lbs. Concentrated Super ...	13	20	4	8	6	0	25	4
7	No Manure	7	20	—		—		—	
8	112 lbs. Mineral Super and Sulphate of Ammonia...	12	30	5	6	5	10	20	4
9	112 lbs. Mineral Super and Bone Super	11	58	4	8	4	38	18	6
10	160 lbs. Thomas Phosphate ...	9	44	5	2	2	24	6	10
11	150 lbs. Mineral Super ...	13	15	5	10	5	53	23	9

It will be seen that plots 10 and 11 received 160 lb. and 150 lb. respectively, instead of 140 lb., as in the other tests. To secure an even application of the manures they were, in each case, mixed with shell sand to make the same bulk of each. On some of the plots the yields were reduced very considerably by the grain shelling, Petatz Surprise wheat being the variety sown. On plots Nos. 1 and 5 nearly 1½ bushels were lost, No. 3 and No. 6 nearly 1 bushel, and several others half a bushel to three-quarters of a bushel per acre. In this series the poor effect of Thomas phosphate is again demonstrated. The yield from the unmanured plot must be regarded, in the face of the dry winter (2 1-3 inches from July 1 to September 30), as satisfactory. The best returns are from plot receiving 1 cwt. of mineral super, while ¾ cwt. of the same manure is a very close second for profit. The sulphate of ammonia in plot 8 seems to have done no good, and but little result appears to have been obtained from the citrate-soluble phosphates in Nos. 4 and 9, the yield being less than the plots receiving the same or a less amount of phosphate, but soluble in water.

NARACOORTE—MR. S. SCHINCKEL.

Mr. Schinckel's plots were on porous black soil, but owing to the lateness of the season and the very cold weather experienced during the winter the crop was practically a failure. On the clay soils, where the moisture was retained better, there was a good crop, but from 63 acres of black land, including the test plots, less than 30 tons of hay was secured. Until cut by hot winds or frost some of the super plots promised a fair return, but the growth on plots receiving Thomas phosphate was much slower, and the wheat did not stool nearly so well.

REYNELLA—MR. A. C. POCOCK.

Seed was sown at end of May on land fallowed early, cultivated six times, and harrowed twice. A very fine tilth was secured before seeding, and the soil was fairly moist; 60 lb. White Tuscan Wheat per acre was sown. Crop was cut for hay on November 18 and 19.

No. of Plot.	Manure per acre.	Yield of Hay per acre.		Cost of Manure per acre.		Profit per acre over unmanured plot, with Hay at £3 10s. per ton	
		tons	cwt.	s.	d.	s.	d.
1	84 lbs. Mineral Super ..	1	3½	3	3	16	0
2	84 lbs. Thomas Phosphate .	1	3½	2	9	16	6
3	84 lbs. Guano Super ...	1	0	3	0	4	0
4	84 lbs. Bone Super ..	1	2	4	0	10	0
5	140 lbs. Bone Super and Mineral Super	1	6	5	10	22	2
6	No Manure	0	18	—		—	
7	112 lbs. Mineral Super ...	1	2½	4	4	11	5
8	44 lbs. Concentrated Super ...	1	2½	4	8	11	1
9	112 lbs. Mineral Super and Sulphate Ammonia ...	1	3½	5	6	13	9
10	140 lbs. Thomas Phosphate ...	1	3	4	6	13	0
11	140 lbs. Mineral Super ...	1	5	5	5	19	1

Owing to unseasonable weather conditions the above results cannot be regarded as satisfactory. Mr. Pocook states that very heavy rain fell on June 14; this was followed by a dry spell with severe frosts, causing the land to set very hard and the crop to turn quite yellow. In the second week in August, after light rains, the plots were harrowed, and the crop soon showed improved colour and growth. The spring was dry, causing the wheat to run to ear too quickly. When in flower severe east winds cut the crop, checking further growth. With hay at average prices the increased crop on most of the plots, resulting from the use of manure, would scarcely be considered profitable. Under the circumstances any comparison of results is useless. Mr. Pocock states that the previous crop on this land was White Tuscan wheat, manured with 200 lb. super per acre, the yield being 3 tons of hay per acre.

SUMMARY OF RESULTS.

Locality.	Rain recorded between date of sowing and of harvesting.	Yield per acre from Plot Receiving																								
		No Manure.		84 lbs. Guano Super.		84 lbs. Bone Super.		84 lbs. Thomas Phosphate.		84 lbs. Mineral Super.		44 lbs. Concentrated Super.		112 lbs. Mineral Super and Bone Super Mixture.		112 lbs. Mineral Super & Sulphate Ammonia.		112 lbs. Mineral Super.		140 lbs. Mineral Super.		140 lbs. Thomas Phosphate.		200 lbs. Mineral Super.		1 cwt. Slack Lime.	
	inches	bus.	lbs.	bus.	lbs.	bus.	lbs.	bus.	lbs.	bus.	lbs.	bus.	lbs.	bus.	lbs.	bus.	lbs.	bus.	lbs.	bus.	lbs.	bus.	lbs.	bus.	lbs.	bus	lbs.
Purnong ...	5	0	36	5	23	5	25	—		5	42	5	16	5	1	—		6	18	6	10	—		—		—	
Lipson ...	8½	3	22	18	30	15	29	12	0	19	16	22	2	20	8	22	2	26	46	27	4	12	55	27	50	—	
Eudunda ...	7½	3	44	7	34	6	47	4	43	7	55	7	10	—		10	4	7	23	10	15	5	55	—		4	46
Mallala ...	9	6	0	14	0	16	0	10	15	17	45	15	15	18	0	16	30	21	15	24	45	12	0	—		—	
Paskeville ..	6½	7	20	13	4	10	24	9	4	13	47	13	20	11	58	12	30	14	28	13	15*	9	44*	—		—	
		Hay		Hay		Hay		Hay		Hay		Hay				Hay		Hay		Hay		Hay					
		ton	cwt.	ton	cwt.	ton	cwt.	ton	cwt.	ton	cwt.	ton	cwt			ton	cwt.	ton	cwt.	ton	cwt.	ton	cwt.				
Reynella ..	—	0	18	1	0	1	2	1	3½	1	3½	1	2½	†		1	3½	1	2½	1	5	1	3	—		—	

* The dressing on these two plots was 10 lbs. and 20 lbs. respectively above the quantities at head of column.

† 140 lbs. bone super and mineral super mixture yielded 1 ton 6 cwt. hay per acre.

From the above figures it will be seen that in most cases the heavier the dressing of mineral super the more profitable the returns, though the results from the plots dressed with 84 lbs. and 112 lbs. of super per acre will probably confirm the practice of most farmers in applying light dressings in preference to heavy quantities. The concentrated super has not yielded quite so well as the equivalent amount of mineral super; this is possibly due to the fact that it contains only a very small percentage of gypsum, which is undoubtedly of some benefit to the land. It is also possible that in applying such a small quantity per acre evenness of distribution was not secured. The question of freight on the two fertilisers is of considerable importance, however. Where the carriage amounts to 10s. per ton, the use of concentrated super instead of ordinary mineral super would represent the following saving:—2⅗ tons ordinary super at 10s., £1 5s. 6d.; 1 ton concentrated super, 10s.; balance, 15s. 6d. But for the difficulty with the appliances at the disposal of the ordinary farmer of securing an even mixture, the results of these experiments would justify one in advising farmers situated at considerable distance from shipping ports to use concentrated super mixed with equal quantities of ordinary gypsum.

EXPERIMENTS WITH RUST-RESISTING WHEATS.

By W. L Summers, Inspector of Fertilisers.

In connection with the Department of Agriculture experiments with rust-resisting or rust-escaping wheats were undertaken last year at Telowie, Pine Forest, Scales Bay, Balaklava, Minlaton, Boothby, Murray Bridge, Aldinga, Wolseley, and Arthurton, by members of the Agricultural Bureau. Owing to the damage resulting from red rust in the 1901 crops considerable interest was manifested in these experiments. Unfortunately for the main purpose of the tests, though to the great benefit of the farming community, rust was conspicuous by its absence last year, so that no comparison can be made as to the liability of the wheats to damage by rust. It should, however, be mentioned that all the wheats tested were reported in 1901 to have escaped damage from rust, and they may safely be regarded as fairly resistant at least. In every case in addition to the seed the department supplied mineral superphosphate to apply to the plots at the rate of about ¾ cwt. per acre. With but two exceptions the plots were half an acre in area, but in the following tables the yields in each case have been calculated at per acre:—

Telowie—Mr. T. Smith.

Land generally a stiff sand, fallowed the previous August and twice scarified before seeding. Seed was sown between May 3 and 14, the soil being loose and dry, though rain fell before Bartlett's Crossbred and Phillis Marvel were sown on the latter date. These two varieties were sown on "lay" ground not of quite so dry a nature as the fallow. Seed sown at rate of 40 lb. per acre. The season was one of the worst experienced in this locality, the rainfall from May 1 to October 31 being 5.91 in.

Results of Experiments

Variety.	Date harvested		Yield per acre.		Remarks.
			bus.	lbs.	
Baker's Early ..	Oct.	20	6	54	A hardy wheat ; grain good
Bartlett's Crossbred ..	,,	,,	15	56	A splendid stooling early wheat ; grain good, but shook a little. Should be a good hay wheat
Rerrat	,,	24	5	48	A better stooling variety than Baker's Early, but not so hardy
Field Marshal ...	,,	24	0	56	Came up very thin, and more than half was destroyed by black rust
Phillis Marvel ...	,,	31	19	6	A splendid wheat for stripping or for hay. The best stooler of any of the varieties tested, but later

The marked difference in the results from Bartlett's Crossbred and Phillis Marvel and the other three varieties is, Mr. Smith thinks, partly due to the "lay" land doing better than the fallow, the latter being very dry and loose. The return is surprising, in view of the very small rainfall (5.91 in.), of which nearly three-fourths of an inch fell within a week of the latest variety being harvested, and too late to do any good. The result is also a striking illustration of the value of super in dry districts, as Mr. Smith's main crops on fallowed land, not manured, only averaged 3 bushels per acre.

Balaklava—Mr. A. W. Robinson.

Plots on sandy loam, fallowed early. The land was cultivated twice, harrowed three times, and once rolled between ploughing and sowing. The land was in fine tilth when sown during first week in May, but was dry. During the growing period only 8 in. of rain fell, long periods of dry weather being experienced.

RESULTS OF EXPERIMENTS.

Variety.	Date harvested	Yield per acre. bus.	lbs.	Remarks.
Gamma	Nov. 14	13	24	Dark grain, weighing 65 lbs. per bushel; rather late. Being nearest to and parallel with the road, it suffered a little from sparrows
Field Marshal ..	,,	18	24	Tall wheat, long head, small beard; grain weighed 65 lbs. per bushel
Gluyas Early ..	,,	26	20	A very early wheat, goes 66 lbs. to the bushel; weak straw, goes down badly
Petatz Surprise ...	,,	13	20	Early; good grain, weighing 66 lbs per bushel; head miserably small
Rerraf	,,	25	0	A good, reliable wheat; stools well; does not shake or go down, but is very difficult to thrash; grain 66 lbs. per bushel
Budd's Rust-resistant	,,	20	48	Very dark in grain, straw, and chaff; weight, 68 lbs. per bushel; does not shake or go down
Wiltunga Wonder ...	,,	17	8	Very similar to Early Para; suffered most from the dry weather; weight, 64½ lbs. per bushel
Allora Spring .	,,	15	32	Dark grain, 68 lbs. per bushel; chaff very dark; shakes and goes down badly

It will be seen that there is a difference of over 11¾ bushels per acre in the yields of the best (Rerraf) and the poorest (Petatz Surprise) varieties. At 5/ per bushel this represents £2 17/6 per acre. Mr. Robinson states that the plots were well tested, as a severe storm of wind was experienced just prior to harvesting. Rerraf and Budd's rust-resistant wheats he considers by far the best of those tried.

MINLATON—MR JAS. MCKENZIE

Sandy loam, fallowed in September, and twice cultivated afterwards. Seed sown on June 10, soil being in good condition, 1¼ in. of rain falling just before seeding commenced. Afterwards the season continued very dry, the rainfall up to November 29 being 8.33 in.

RESULTS OF EXPERIMENTS.

Variety.	Date harvested	Yield per acre. bus.	lbs.	Remarks.
Gluyas Early .	Nov. 29	20	16	Good grain, weak straw
Allora Spring .	,,	12	50	Small grain, very smutty
Field Marshal ...	Dec. 9	13	29	Fair grain, slightly blighted
Gallant	,,	12	25	Looked very well, but did not yield as much as expected
Phillis Marvel ...	,,	13	14	Top of every head was blighted
Marshall's No. 3 ..	,,	14	1	Good grain, but straw rather weak
Gamma	,,	14	17	Good grain, stands up well; a good wheat

Steinwedel, yielding 17 bushels 12 lb., and Bluey (Dart's Imperial) 16 bushels, were also tried. These two showed rust on the straw, but the grain was not affected. The other varieties were quite free of rust. The grain in all was more or less pinched owing to hot, drying winds.

Tiparra—Mr. W. H. Hawke.

Wheat sown on May 24 on fallowed land, a clay loam. Owing to dryness wheats did not germinate well until June 15. Total rainfall from seeding to harvest, 8.67 in.

Results of Experiments.

Variety.	Came into head on	Yield per acre.		Remarks.
		bus.	lbs	
Gamma ..	Oct. 24	18	52	Straw, 2 ft. 6 in. high ; holds grain well ; a good milling wheat
Marshall's No. 3 ..	,, 24	21	10	2 ft. 6 in. high; rather tough to thrash; holds grain well; good milling; stands up well
Field Marshal	,, 15	18	30	Weak straw, 2 ft. 9 in high ; shakes badly ; should be sown thickly
Phillis Marvel .	,, 24	21	26	Straw, 2 ft. 9 in. high ; stands well and does not shake out ; good milling grain, and, though very chaffy, threshes fairly well
Budd's Rust-resistant	,, 24	20	56	Straw, 2 ft. 6 in. high ; stands up very well ; does not shake ; good milling, and threshes well ; grain rather small
Gluyas Early .	,, 1	19	48	Very weak straw, 3 ft. high ; requires 1 bushel of seed per acre ; good milling, but very tough to thresh
Wiltunga Wonder ..	,, 8	23	2	Straw, 3 ft. high, and rather inclined to go down; good milling wheat; rather tough to thresh
Smart's Early ..	,, 11	20	8	Straw, 3 ft. high; stands up splendidly, but grain shakes somewhat; good milling wheat
Rerraf	,, 15	20	24	Straw rather weak ; grain small, but good milling ; exceptionally tough to thresh

Mr. Hawke states that Gluyas and Rerraf are very tough to thresh, the latter especially so, causing considerable trouble with the spoutings. They will only thresh properly on a very hot day. The hot winds forced the later varieties into head too quickly, and the yields suffered accordingly.

Murray Bridge—Mr. A. G. Kutzer.

Soil a sandy loam, with stiff, red clay subsoil; fallowed early, but not cultivated again until ready to sow. A good tilth was secured, but there was very little moisture in the ground at seed time. The season from June 15 was fairly good up to middle of September, but a succession of hot, dry winds followed, and did a lot of harm, especially to the later varieties. From seed time to harvesting (December 9) 7.39 in. of rain fell.

Results of Experiments.

Variety.	Season.	Yield per acre.		Remarks.
		bus.	lbs.	
Baker's Early ...	Early	15	4	Good grain ; light white straw
Gluyas Early ..	,,	17	26	Grain good ; straw, light pale yellow
Smart's Early ..	,,	15	18	Good grain ; good purple straw
Field Marshal ...	,,	16	40	Good grain ; light white straw
Gamma	Medium	13	16	Good grain ; good purple straw
Marshall's No. 3 ...	,,	13	3	Grain slightly pinched ; good purple straw
Phillis Marvel	,,	12	6	Grain badly pinched ; good dark purple straw
Silver King	,,	13	26	Good grain ; good pale purple straw

Mr. Kutzer states that there were no signs of rust on any of the wheats, and he is well pleased with the results. The four later wheats would have yielded better had they not suffered so much from hot winds.

PINE FOREST—MR. R. BARR, JUN

Land partly sandy and part stony flat; fallowed in July, 1901, harrowed twice, and cultivated three times. Tilth like an onion bed, but soil was dry, less than a quarter of an inch of rain being recorded in April. Seed sown on May 1. Season throughout was very dry, only 6.7 in. being recorded from May 1 to November 17, date of harvesting. The crops throughout the district were practically failures, the results from the plots being about the average of crops sown in May. No rust was visible in any of the crops.

RESULTS OF EXPERIMENTS.

Variety.	Yield per acre. bus.	Yield per acre. lbs.	Remarks.
Field Marshal ...	1	53	Weak straw ; goes down before ripe
Budd's Rust-resistant	2	9	Straw not strong enough
Baker's Early ...	2	4	Another "weak-kneed" variety
Petatz Surprise ...	1	28	Owing to small grain running freely through the drill this was sown thicker than the others
Smart's Early ..	3	8	The best wheat of the lot ; a good, stout straw ; stands up well, and does not shake out
Gluyas Early ...	2	25	Too weak in straw ; goes down badly
Berraf	3	2	A good wheat, but hard to thresh
Bartlett's Crossbred ..	2	49	Worth trying again, as it promises well

It will be noticed that Mr. Barr condemns Budd's rust-resistant wheat as weak in the straw, whereas the others speak of it as standing up well and holding its grain. The poor growth in Mr. Barr's instance is probably the cause.

ALDINGA—MR. T. PENGILLY.

Light loam over limestone; fallowed in June, 1901, and cultivated five times between ploughing and seeding. Seed sown on April 30, the soil being moist and a good tilth secured. A dry spell followed seeding, but the season generally was fairly favourable. Crop harvested during first week in December.

RESULTS OF EXPERIMENTS.

Variety.	Yield per acre. bus.	Yield per acre. lbs.	Remarks.
Wiltunga Wonder ...	11	44	Not strong enough in straw ; shells somewhat
Gluyas Early ...	17	39	Tall weak straw ; shells, and goes down badly
Gamma	17	52	Very promising variety ; stands up well
Marshall's No. 3 ...	14	20	
Silver King	14	26	A promising variety for hay
Field Marshal ...	14	44	
Majestic	17	34	A very nice wheat ; good, stout straw ; should make a good hay wheat
Gallant	14	52	A promising variety

Alongside these plots Mr. Pengilly had a considerable area of Hudson's Purple Straw, which yielded 24 bushels per acre. Three of the best American strong-floured wheats, viz., Scotch Fife, Power's Fife, and Minnesota Bluestem were grown in small plots, but were complete failures, the straw being barely 2 ft. high and the yield poor.

WALLOWAY—MR. T. H. P. TAPSCOTT.

Mr. Tapscott reports that owing to the severity of the drought and to the ravages of grasshoppers his experiments were a complete failure.

BOOTHBY—MR. A. A. TURNBULL.

Land a red loam, with clay subsoil; fallowed August and September, 1901, then harrowed. Ploughed and harrowed again prior to seeding, which took place on June 12, a fine tilth being secured. The soil was rather dry at seeding, though light showers fell the following day. Rainfall from seeding to harvest, 10.3 in.; generally not of a soaking character. In this district the season proved most disastrous, the yields being very inferior, though any fallowed land treated with manure yielded well.

RESULTS OF EXPERIMENTS.

Variety.	Date harvested	Yield per acre.		Remarks.
		bus.	lbs.	
Phillis Marvel ...	Dec. 6	5	24	Medium variety; no rust; fair average quality grain
Allora Spring ...	Nov. 28	8	44	Early wheat; no rust; fair grain
Gamma	„ 28	7	16	Medium wheat; no rust; fair quality grain
Gluyas Early ...	„ 21	6	56	Early wheat; no rust; extra good grain
Gallant	„ 28	8	12	Medium wheat; no rust; fair average grain
Marshall's No. 3 ...	„ 28	10	20	Medium wheat; no rust; fair average grain
Smart's Early ...	„ 21	14	52	Early wheat; few signs of rust; very good grain
Baker's Early ..	„ 18	8	50	The earliest of the varieties; no rust; very good grain

WOLSELEY—MR. E. PRESCOTT

Land sandy loam, with patches of red clay; fallowed late, and ploughed again before seed time. Heavy rains caused the soil to set hard, delaying seeding operations till end of June, when the soil was, if anything, too damp. Up to October rains were very light, and the crops suffered severely during August and September owing to insufficiency of moisture. But for the later rains the crops would probably have yielded less than 6 bushels per acre. Rainfall from seeding to harvest, about 10 in.

RESULT OF EXPERIMENTS.

Variety.	Yield per acre.	
	bus.	lbs.
Phillis Marvel	13	12
Silver King	15	21
Majestic	13	17
Marshall's No. 3	11	2
Gluyas Early	13	21
Gamma	10	40
Gallant	9	42

Mr. Prescott states that under the circumstances the yields can be considered satisfactory. The seed was put in very late. No rust or smut was visible on the wheats, and all the grain was of full marketable value.

SUMMARY OF RESULTS.

Variety.	Yield per Acre at																	
	Telowie.		Balaklava		Minlaton		Tiparra.		Murray Bridge.		Pine Forest.		Aldinga.		Boothby.		Wolseley.	
	bus.	lbs.	bus.	lbs.	bus.	lbs.	bus.	lbs.	bus.	lbs.	bus.	lbs	bus.	lbs.	bus.	lbs.	bus.	lbs.
Baker's Early ...	6	54	—		—		—		15	4	2	4	—		8	50	—	
Bartlett's Crossbred ...	15	56	—		—		—		—		2	49	—		—		—	
Rerraf	5	48	25	0	—		20	24	—		3	2	—		—		—	
Field Marshal ...	0	56	18	24	13	29	18	30	16	40	1	53	14	44	—		—	
Phillis Marvel .	19	6	—		13	14	21	26	12	6	—		—		5	24	13	12
Gamma	—		13	24	14	17	18	52	13	16	—		17	52	7	16	10	40
Gluyas Early ...	—		20	20	20	16	19	48	17	26	2	25	17	39	6	56	13	21
Petatz Surprise ...	—		13	20	—		—		—		1	28	—		—		—	
Budd's Rust-resistant	—		20	48	—		20	56	—		2	9	—		—		—	
Wiltunga Wonder ...	—		17	8	—		23	2	—		—		11	44	—		—	
Allora Spring ...	—		15	32	12	50	—		—		—		—		8	44	—	
Gallant	—		—		12	25	—		—		—		14	52	8	12	9	42
Marshall's No. 3 ..	—		—		14	1	21	10	13	3	—		14	20	10	20	11	2
Smart's Early ...	—		—		—		20	8	15	18	3	8	—		14	52	—	
Silver King ...	—		—		—		—		13	26	—		14	26	—		15	21
Majestic	—		—		—		—		—		—		17	34	—		13	17

Report from Mr. D. P. Thomas, of Scales Bay, on results of tests of varieties supplied to him has not yet come to hand.

ORIGIN AND CHARACTERISTICS OF VARIETIES.

Bartlett's Crossbred.—This is a very early rust-resistant wheat; not so weak in the straw as some of our early wheats. It is a selection made by one of our northern farmers, and sent to the Agricultural Bureau about 1890 for distribution. All trace of the originator has, however, been lost.

Budd's Rust-resistant.—This wheat was selected by Mr. Budd, of Telowie, about 1890, and was named and distributed by the Agricultural Bureau. Although not an early wheat it appears to do well in the northern areas, is rust-resistant, and worthy of extended cultivation.

Kerraf.—This wheat was sent out under the name of "Karraf," and is one of Mr. W. Farrer's crossbreds. Following the peculiar style popular some time back Mr. Farrer immortalized his name in this wheat by spelling it backwards. This variety has generally yielded well, is a good milling wheat, and a proved resister of rust. One drawback, however, is that it is exceptionally difficult to thresh.

Field Marshal.—This is another of Mr. Farrer's selections. It yields well, but is rather weak in the straw, and has a tendency to shake out.

Phillis's Marvel.—This is a selection made by a farmer of the same name living near Snowtown. It is a midseason wheat, apparently rust-resistant, stands up well, holds its grain, and yields well. It is a very promising wheat.

Gamma.—This wheat was raised by Mr. W. H. Hawke, of near Arthurton, in which district it has been grown on a fairly large scale. A midseason wheat, rust-resistant, strong straw, and holds the grain well.

Gluyas Early. A very early wheat, raised in Telowie district by Mr. Gluyas. It is rust-escaping and probably rust-resisting. A good milling wheat, yields well, but is very weak in the straw.

Petatz Surprise.—A selection from Caltowie district, where it is highly spoken of as escaping injury from rust. It is an early wheat, weak in the straw, grain small, but good. Appears to yield indifferently in most localities.

Wiltunga Wonder.—A selection from a mixed crop grown by Mr. J. St. J. Mudge, of Pine Forest Bureau, about five years ago. This wheat was reported to have yielded well, and to have been free from rust in 1901.

Baker's Early.—This wheat is stated to have originated in the mid north. It was selected from a crop of Dutoit wheat by Mr. G. Baker, sen. In 1897 Mr. J. McColl, of Kingswood, received a few ounces of seed, and has grown it in considerable area since. He has found it very hardy during the dry seasons, and it is reputed to be resistant of rust.

Allora Spring.—This variety came to Australia from California. It was very strongly praised in the other States a few years ago, but is not very promising here. It is weak in the straw, the grain shells, and the yield is considerably less than several other varieties tried.

Gallant.—A mid-season rust-resistant wheat, raised by Mr. R. Marshall at Templars. Mr. Marshall speaks very highly of this wheat, but it has not done very well on our test plots.

Marshall's No. 3.—This is another of Mr. Marshall's selections. It is largely grown in South Australia as well as in Queensland, and is one of the best rust-resistant wheats grown to any considerable extent. It is not, however, suitable for the early districts.

Smart's Early.—A prolific wheat, good grain, stands up well, and is rust-escaping. Around Caltowie and Yarcowie it is very highly spoken of. This variety, I believe, originated in Baroota district about seven years ago.

Silver King is another of Mr. Marshall's wheats; a good yielder, stout straw, and rust-resistant. A midseason wheat, that has not yielded so well as expected. It is not suitable for our earlier districts.

EXPORT OF APPLES.

The Manager of the Produce Export Depot desires to remind shippers of apples that a Holt Blue Funnel steamer will be leaving Port Adelaide on March 4. Immediate application should be made for space by intending shippers, as at present our apple crop promises to be a good one. Other steamers of the same line will leave about March 25 and April 15. As all space in the P. & O. and Orient liners has already been taken up, it is imperative that intending shippers should make early application for space in the Blue Funnel boats.

ROSEWORTHY AGRICULTURAL COLLEGE NOTES.

HARVEST NOTES.

By J. D. Towar, Professor of Agriculture

The wheat harvest and all threshing were completed on December 23.

The crop was disposed of as follows:—

Field No. 4.—All cut for hay. The 120 acres yielded about 165 tons.

Field No. 7.—About 35 acres were ploughed under early in September, and sown to summer crops. The balance of the field was nearly all put into the silo; a small portion stacked as loose hay was fed to the cows in the pasture lot

Field No. 16.—One-half was cut for hay, and the other half cut with the binders and threshed. The part harvested as grain, 31¾ acres, was about an average of the field, and yielded 14 bushels 38 lb. per acre.

Dahlitz Field.—Forty-three acres were ploughed under the last of September, and is again being fallowed in the hope of getting rid of some of the poppy, with which it is badly infested.

Ebsary's A.—Forty-seven and a half acres, exclusive of borders, which were cut early for hay, were cut with the binders, hauled to the barn, weighed and threshed, thereby giving definite results of yields of hay and straw as well as the threshed grain. The yields below "as hay" are indicated by the gross weight of the crop or ripened grain, and, while not properly weights of hay, they are relatively correct.

FERTILISER TESTS, ROSEWORTHY COLLEGE, 1902.

Variety of Wheat—King's Early, Sown April 29 and 30.

Fertilisers, 2 cwt per acre.	Approximate Analysis per cent. Water-soluble Phosphate.	Area.	Seed per acre.	Yields per acre.			
				As Hay.	Grain.		Straw.
		Acres.	lbs.	lbs.	bus.	lbs.	lbs.
Wallaroo Superphosphate ..	37·5	10	57	2,173	12	47	1,416
,, Special Manure, No. 2	—	5	64	2,330	13	33	1,516
Adelaide Chemical Works—							
Guano Super ..	*28	2½	60	2,040	12	6	1,214
Wheat Manure ...	—	2½	64	1,836	11	18	1,160
Superphosphate ...	†16	2½	69	1,836	10	49	1,186
Mineral Super ..	39	2½	65	2,354	14	40	1,474
Super B.	*28	2½	68	2,272	12	50	1,501
D. & J. Fowler, Lion Super ...	43·3	1	67	2,410	13	43	1,587
No Manure	—	1	72	1,330	8	19	831

* And 3 per cent. citrate-soluble phosphate.

† Also contains 20 per cent. citrate-soluble phosphate and 2·5 per cent. nitrogen.

The above yields, while showing a marked increase due to the effect of the phosphates and higher yields from the better manures, are still very unsatisfactory. In every case the increased yield has more than paid for the cost of fertilisers in the production of grain alone, while as hay, considering the present price, the manures have increased the money value of the yield over the "no manure" plot by four times their cost. The results would be considered a little more reliable had there been several "no manure" plots among those treated, and, indeed, if all the plots had been sown in duplicate. Owing to the very light rainfall of the season (less than 12 in. for the year) there is every reason to assume that the above yields would have been relatively different had the rainfall been sufficient to produce a normal growth.

Test of Different Quantities of Manure per Acre.

Adjacent to the "no manure" plot in the above experiment were three other plots receiving different quantities of manures, which the table following will fully explain:—

Treatment.	Area.	Seed per acre.	Yields per acre.			
			Hay.	Grain.		Straw.
	Acres.	lbs.	lbs.	bus.	lbs.	lbs.
No manure	1	72	1,330	8	19	831
1 cwt. super per acre	2	63	1,655	9	0	1,115
1½ ,, ,, ,, ...	2½	78	2,138	10	6	1,530
2 ,, ,, ,, ...	8½	63	1,728	10	33	1,094

These results stand in the same order they did in the report of one year ago, although the advantage from increasing the application of manures is not so marked. Indeed, it barely paid for the cost of material and expense of applying, and would not were wheat at the usual price. It might be safely noted, however, that to all appearances the plot receiving 2 cwt. was at a decided disadvantage owing to an inferior quality of soil in that portion of the field. The lighter growth of straw is evidence of poorer soil, but the additional fertiliser told in the crop of grain.

In the broadcast versus drilling test the broadcasting has again come out ahead, giving per acre 2,291 lb. hay, or 12 bushels 39 lb. grain and 1,531 lb. straw, as compared with 1,728 lb. hay, or 10 bushels 33 lb. grain and 1,094 lb. straw, from drilling. The broadcast plot came up more slowly and even, while the drilled plot was patchy, and never so promising. A similar experiment one year ago showed a victory of 3 bushels 21 lb. for broadcasting.

Wheat Variety Tests.

These tests were conducted in Fields Ebsary's B and C. All the seed was uniformly treated by the bluestone method for destroying smut, and in seeding the drill was set for the same quantity per acre for every variety. By actual weight, however, there was a marked variation in the quantities sown, as seen by the following table. The manure applied was 2 cwt. per acre of 36-38 per cent superphosphate. The first six varieties in the table were grown on Field C, a portion of which is of a more sandy nature than Field B, where the remaining varieties were grown:—

Variety.	Yield per acre last season.		Date of Sowing.		Seed per acre.	Area.	Yields per acre.	
	bus.	lbs.			lbs.	Acres.	bus.	lbs.
1. Early Purple Straw	21	35	April	24	78	3⅝	8	7
2. College Selection	25	54	,,	26	64	4	11	16
3. California Purple	23	4	,,	25	49	3⅝	6	48
4. Smart's Pioneer	25	59	,,	25	63	5	10	8
5. Fan	27	11	,,	25	65	5	10	59
6. Neumann's	23	33	,,	28	64	7¾	9	12
7. Warwick	23	0	,,	24	68	4¼	5	58
8. Jerkin	20	56	,,	24	71	6	7	44
9. Gluyas	19	26	,,	23	70	6	9	8
10. Purple Straw	26	9	,,	23	46	6	5	11
11. Medeah	Not sown last year		,,	23	72	1½	6	42
12. Majestic			,,	23	75	4	5	31
13. Marshall's No. 3 .			,,	22	65	3⅛	3	24
14. College Selection	25	54	June	24	(?)	2⅘	12	3
15. Leak's Rust-proof ...	Not sown last year		April	22	69	5⅜	8	8
16. Tuscan	21	49	,,	22	52	2¾	4	0
17. College Selection	25	54	June	24	(?)	5¼	12	49
18. Dart's Imperial	24	39	April	21	52	8	8	32
19. Defiance	24	41	,,	21	55	8	7	54

Little comment is necessary on the above, as the figures speak for themselves. College Selection (No. 2), while giving the best yield in Field C, had some advantage over Smart's Pioneer, Fan, and Neumann, because over one acre of its poorest portion was cut for hay.

The College Selection on plots 14 and 17 was sown on portions of the Marshall's No. 3 and Tuscan plots, which, after two months of growth, gave no promise of success, were scarified up, and sown with the College wheat. The result, while proving the wisdom of the move, was further evidence of the opinion that for the season the early sowing was not advisable. The yield of King's wheat in No. 16 of nearly 15 bushels per acre from seeding made May 15 indicates that a little more delay in the seeding would have probably given better results.

The Gluyas, with a yield of 9 bushels 8 lb., sown between Jerkin with 7 bushels 44 lb., and Purple Straw 5 bushels 11 lb., together with the fact that it gave the highest yield of any in the field except the very late seeding, stands well to the front as a favourite variety; and yet it gave the lowest yield of any in the former year's trial.

There was absolutely no smut and scarcely a trace of rust in any of the varieties. Of the above the College will be able to sell for seed a few bushels of the following varieties:—King's Early, College Selection, Neumann's, Dart's Imperial, Defiance, Fan, Smart's Pioneer, Jerkin, Gluyas, Early Purple Straw, Purple Straw, California Purple, Warwick, and Leak's Rust Proof.

Comment by Professor Perkins.

As in the first year of his introduction to South Australian conditions Professor Towar has had to report on a harvest considerably below the College normal records, I feel it incumbent upon me, as originally responsible for the crops, to supplement his statement with a few explanatory notes. Had returns been up to my hopes, or equal to the interest I had taken in the work that had temporarily devolved upon me, I should not have shunned what credit could have been deflected in my direction; but neither the fact that events proved me over-sanguine, nor that not even average results can be shown against the magnificent crops secured by others, should cause me to refuse any reasonable amount of blame that might justly be set to my account. After all, success is the touchstone by which man must be judged; and failure, however ill-deserved, cannot by any possible means be juggled into even seeming success. My remarks must not, therefore, be looked upon in the light of excuses, but as an honest attempt to reach at the causes underlying a regrettable failure.

Our dear old friend the weather must bear a considerable portion of the blame, or, perhaps, more justly, those who would not understand that the drought had not broken up in 1902. If there is one feature more than another that dominates the characteristics of the past season I think it may be described as its extreme patchiness, and I am forced to believe that within the good rainfall area we occupied during the past season one of the driest patches of all. No doubt it is within the minds of all with what jubilation after an exceptionally dry summer was received the heavy fall of rain late in March, 1902. On the 25th of that month we were favoured, or, as events proved, cursed with 1.46 in. of rain. The rain was general throughout the country, and the Press did not hesitate to announce that at last the great drought had broken up, and to speculate on the magnificent prospects of the season. Unfortunately for me my optimism was not a whit behind theirs. Following on Professor Lowrie's parting advice I had ploughed up some 80 acres of land, which were destined to receive an oat crop. In the same field the same practice had been followed two years previous by magnificent results, and I saw no reason to doubt equal success. Alas! for the best plans of mice and men: this is Field No. 7, referred to by Professor Towar as being ploughed up afresh and put under summer crops. It was a complete failure, and as sure a tribute to the value of fallowing in this district as could well be desired.

That March rain was the last we were vouchsafed until June 2, when we had to be content with a quarter of an inch. Nevertheless, I could not well tell what was ahead, or else I should probably have followed Professor Towar's advice, and delayed the seeding. I had, however, two ideas well in my mind. First, that in spite of appearances we had done with the drought; second, that in this district, at least, in nine years out of ten early sowing was best policy. Perhaps, too, a forgotten reminiscence of my earlier African training obtruded itself on my all-unconscious mind, whereby the wisdom of such a policy was strongly upheld. In brief, seeding operations started with the oats on April 15, the ground still being sufficiently moist to bring about shortly afterwards partial patchy germination. On the 21st the later wheats, such as Defiance, Dart's Imperial, &c., were taken in hand. By the 30th the whole of the fields known as Ebsary's were under wheat, comprising our manure and varieties tests, usually the main feature of the College work. We could congratulate ourselves on not being interrupted during seeding operations, as April was practically a rainless month, only 0.03 falling to our lot on the 27th. As these were essentially wheat plots I was particularly anxious that they should be clean and free from bunt. Professor Lowrie's previous experience had already shown that hot water pickling, although entirely satisfactory in wet weather and wet land, was if anything detrimental to dry seeding. I determined, therefore, that the whole of the seed should be pickled with bluestone. Mistake No. 2. The field was still sufficiently moist to induce partial germination, and I had the mortification of seeing neighbours' fields sown at the same time, but not pickled, green with the rising corn, whilst ours hung fire under the balefully retarding action of the bluestone. In the meanwhile the ground was drying rapidly, and no rain came to replace the lost moisture. Much of the grain malted, whilst what escaped lay snugly ensconced beneath the soil ready to come up with the poppies!

A rainless April was succeeded by a dry May, under a quarter of an inch falling in the whole month, scattered over six different days. Such rains made practically no difference to the soil, which continued to dry up apace, whilst the wheat obstinately refused to show up above ground except in a few scattered patches. We were now seeding in perfectly dry land, in which the wheat could take no harm; and effectively these late-sown fields proved our only partial success, which, however, was poor compensation for the loss of our special plots.

Unfortunately I have not yet completed the list of last year's failures. The field known as Dahlitz was fallowed on the advice of Professor Lowrie early in October after an opportune fall of rain. Except the March fall this field received subsequently no rain, and the complete failure of the crop stands as another testimony, if any were required, to the error of late fallowing.

There is no doubt, however, that in spite of defective germination the crops would not have been the failures they undoubtedly were had the ground been clean. As it is, much to my surprise, the fields were early red with poppies, Professor Lowrie's special enemies, as he used to call them. Had weather conditions permitted the wheat to get away there is no doubt that it would have taken little harm from commensalism with these weeds. For the punishment of my sins they germinated simultaneously, and in most cases the latter prevailed. I cannot lay it to my conscience that the fallows were badly worked; they were kept well tilled throughout the preceding season; in fact, I had no reason to believe that this special portion of the farm was a hotbed of poppies. I am convinced that in such cases a horse hoe with 10 or 21 tines suitably adjusted would save the crop at very small cost, and had I continued in charge I should probably have attempted the experiment. As it is, I handed over the reins of management on May 20.

There is another reason that may tend to account for much of the faulty germination—a reason of which I was not at the time aware, although it may be thought that I should have been. I had many occupations at the time, and beyond visiting the fields from time to time I could not possibly supervise seeding operations. It came to me, therefore, as a matter of considerable surprise when hunting for malted grain to find that the seed had frequently been buried 4 to 5 in. deep! That was the last straw or the last link in a season woven with unfortunate occurrences.

I am sure we all wish Professor Towar greater success and more luck than have fallen to my lot with the crops that he may be called upon to sow during coming years.

EXPERIMENTAL VINEYARD

BY H. E. LAFFER, SUPERINTENDENT OF VINEYARD.

The prospects of a good vintage were greatly improved during December owing to the general heavy rains which fell over all districts. Up to the end of November only 9.37 in. of rain had been recorded; but in the following month an extra 2.32 in. fell. This brought the yearly total up to 11.69 in., or nearly half an inch below any year since the College was started.

The vines had begun to go backward, the fruit was very small, and the whole appearance of the vineyards indicated a great want of moisture in the soil. Fortunately, however, the weather, on the whole, had been comparatively cool, otherwise the condition of the crop would have been decidedly worse. The late rains have now practically assured a good vintage, and, in fact, with the cool weather experienced during January, there is a possibility of the fruit being too watery. The ripening of the grapes is very slow and irregular.

Zante currants, which set a very fair crop owing to the ring-barking, are now almost ready for drying, and this operation will be undertaken as soon as possible. The ring-barking of Cape currants had a very beneficial effect, and, though not doing so well as with the Zante, some very nice compact bunches have been obtained.

One result of the heavy rains was to start a fine crop of weeds of all descriptions going. Chief among these were wild melons, which are a great nuisance when cultivating, should they be allowed to assume any great size. A few days' scarifying in warm weather soon demolished these, making so many less to grow next year.

Some time ago I mentioned having tried to revive apricot trees, which were yellow, and apparently dying, with ferrous sulphate in solution. The experiment has not been successful, owing to one of two reasons. Either that it is not effective, or else the trees did not receive enough water. Owing to shortage of water, we were not able to give the trees a good soaking, and this may account somewhat for the failure of the test. The experiment will be continued next year under more favourable conditions.

Owing to the dry season, the crop of fruit at the College was very poor. Some very fine apricots were gathered from grafts on almond stocks, but the bulk was small and poorly flavoured. Birds are proving a great nuisance again this season, the starlings especially being present in large numbers. They attack the grapes as soon as the fruit begins to colour, and devour a large amount in a day.

The following is a table of rainfall for 1902:—

	No. of days on which rain fell.	Total for month.
January	6	.40 in.
February	2	.44
March	1	1.46
April	1	.06
May	6	.22
June	12	2.52
July	6	1.03
August	6	.80
September	8	.92
October	9	1.20
November	4	.28
December	5	2.32
Total		11.65

RINGBARKING OF VINES: AN ANSWER TO MR. W. C. GRASBY.

By Arthur J. Perkins, Secretary for Agriculture.

My recent comments on Mr. W. C. Grasby's opinions on ringbarking appear to have raised a regular storm in "Garden and Field" teacups. The codlin moth number has now been followed up by a special Perkins number. I almost hesitate to refer to the subject again, and were it not that in a series of headings of more than questionable taste Mr. Grasby has taken upon himself the double rôle of defendant and judge I should have been content to let the matter rest. I shall in any case endeavour to be more concise than my voluminous critic.

First, let me point out that he passes over in silence what had principally led me to comment on his opinions, viz., the probable effect of ringbarking on grapes possessed of seeds. Perhaps he adopts my experiments as conclusive, and recognises that there is not necessarily any connection betwixt ringbarking and his theory of non-fertilization?

Let us now examine this question of non-fertilization as exemplified in the currant vine. I cannot perceive that Mr. Grasby's answer helps to elucidate the question one whit. We are not even informed of the results of his experiment with the single bunch. My own position in the matter was clear enough. I expressly stated that I did not look upon Mr. Grasby's views on the matter as altogether untenable; but that I could not accept them unless corroborated by something more definite than the results of the emasculation of a single bunch. Mr. Grasby's dissertation on the origin and perpetuation of cultivated plants is interesting, no doubt, but beside the mark here. What is wanted is definite experimental proof, which can be confirmed by others. In this connecton Mr. Grasby makes much of a statement of mine to the effect that I knew of no case of parthenogenesis in the vegetable kingdom, and from the space he devotes to the discussion of this question one would almost feel inclined to think that he looks upon analogy as a good substitute for experimental proof. It is certainly unfortunate that I should not have recollected some of the fairly well-established cases of parthenogenesis amongst the Cryptogamia. As for those amongst the Phanerogamia, quoted by Mr. Grasby, they appear to be exclusively based upon inference, which is hardly satisfactory evidence. My error of statement does not, however, serve to establish Mr. Grasby's case, whatever he may think; nor does it necessarily invalidate, as he would imply, my criticism of his views. He quite misunderstands the meaning of the word evidence, when he states that I adduced the absence of parthenogenesis in the vegetable kingdom as evidence against his views. As evidence, its presence or absence goes for nothing; experimental proof alone can constitute evidence.

Mr. Grasby appears to query my statement as to the abortion of the seeds of the currant; if by this he should mean that the ovules never develop, he must abandon the parthenogenesis analogy, for without development of ovules we can have no parthenogenesis, but a simple phenomenon of abnormal growth. In brief, the question rests very much in the same position as I left it, and "until better informed and convinced by a series of well-conducted experiments I must continue to believe that, unlike a leaf or bud, the ovary of the Zante currant flower will not develop until the ovules have felt the influence of the pollen."

We next come to the cause of the efficacy of ringbarking. Mr. Grasby, following the opinion that came into vogue when Harvey first discovered the circulation of blood in animals, believes that the removal of a ring of bark (I use the term in its popular sense) shuts off the roots from the elaborated plant food, which accumulates above the incision, and becomes responsible for all the good effects of ringing. I hold, and continue to hold, Mr. Grasby's numerous quotations notwithstanding, that ringbarking is a severe surgical operation, which checks the growth of vigorous plants, forcing them, as is ever the case in the vegetable kingdom, from wood and leaf growth to fruit production. Mr. Grasby has quoted numerous extracts from authorities of varying weight, supporting as he supposes his views on the matter. Let me first point out that because some authors of standing believe in the existence under normal conditions of a special set of cells for the distribution of the elaborated material, it does not follow that they would necessarily endorse his old-fashioned view of the action of ringbarking. From Mr. Grasby's quotations of Kerner and Campbell, we must agree that they at least are in accord with him, but there is one weak point in their evidence which tends to show that with them anticipation must have been father to the thought. Both apparently state that ringbarking, in consequence of the accumulation of elaborated material above the incision, is responsible not only for an improvement in the fruit, but for more luxuriant growth. Now this is so notoriously incorrect that Mr. Grasby would have strengthened his case had he judiciously excised it from the quotation. In fact, this is the weak point of the whole theory; if so much food is stored up above the incision, why is growth generally weakened instead of improved? And why do vigorous water shoots not uncommonly grow below the incision? Further, in accordance with general experience, the presence of an excess of food should serve to further accentuate the bad setting of the fruit, and not improve it, as we know to be the case.

Why the old heresy of the descending sap should, in some form or other, constantly reappear in textbooks is easily accounted for. Its would-be analogy with the circulation of blood so much simplifies matters for the popular instructor that it must die a hard death. In his last quotation from Reynolds Green, Mr. Grasby appears to have got some inkling of the matter. He protests that he knew enough of cell structure not to suppose that there was a "continuous stream of sap flowing like water in a pipe." I did not even mentally do him that injustice, but the old votaries of the descending sap theory knew as much about cell structure as Mr. Grasby. I am very much afraid that Mr. Grasby misses the point, though perhaps he is as much at home in physics as he is in vegetable physiology. There is evidently an upward flow of liquid to make good losses by evaporation through the leaves; this is the ascending sap. But why should there be a descending flow, when it is a condition of their very existence that tissues below should constantly be gorged with moisture? There is no void to be filled, and consequently no descending sap. Certainly in the course of time materials elaborated in the leaves must reach the roots, but it has long been recognised that such transference can only take place by osmosis, through the cell walls and from cell to cell, and, wherever conditions favour precipitation, part of the materials are retained in an insoluble state by the cells. The elaborated material is therefore attracted from cell to cell, and if, as appears to be maintained by some of Mr. Grasby's authorities, it is transmitted from the fast in a lateral and inward direction, the very laws of osmosis by which this end is achieved would compel the cells that receive it to transmit it in a downward direction to cells below. It cannot, therefore, be maintained that the elaborated material is transmitted in a downward direction exclusively through the bast; nor even in greatest proportion through this channel, as other tissues offer a far more extended surface for osmotic transmission. Severance of the bast in ringbarking cannot, therefore, confine the elaborated material above the incision, as Mr. Grasby maintains. Nor can it cause injury to the root system to any greater extent than to any other portion of the plant.

The swelling on the upper section is easily explained. Wherever a wound occurs there is a flow of nutritive elements to repair the damage done. This natural process is utilized in grafting, when the healing tissues of two plants meet and unite. All plants show a tendency to produce callus more abundantly on a section looking towards the plant, than one looking from it. Let me illustrate my meaning by an example not connected with ringing. If a cutting is left buried in sand in a horizontal position, it will give rise to callus or healing tissue only on the lower surface. This accounts for the greater swelling above than below in trees that are ringed. The healing tissue works downwards.

It is with regret that I notice that Mr. Grasby has not been able to refrain from personalities. To accuse me of lack of knowledge and want of thoroughness in no wise improves his case, unless he wishes to draw attention to his own superior qualifications; and what has my lucrative position to do with ringbarking? Were one to judge from the triumphant ring of his headings alone one would have thought that his case was too strong to render necessary any abuse of the plaintiff's attorney.

A VISIT TO VICTORIA.

Paper read by Professor Perkins before the S. A. Vinegrowers' Association.

In furtherance of your request to the Hon. Minister of Agriculture, I visited the principal vine centres of Victoria early in December last, with a view to collecting information having reference to the phylloxera and the vine industry as a whole. I have now pleasure in submitting to you the results of such observations as I was able to make.

I propose prefacing my remarks with a brief historical retrospect of the phylloxera question in Victoria. The insect was first discovered in the Geelong district towards 1877; its power for evil was well known at the time, and the Victorian Government made some attempt to stamp it out, both New South Wales and South Australia, as interested parties, contributing towards the cost of the undertaking. Little at the time, however, appears to have been known of the life history of the pest, and still less of the most effective methods of treatment with which the difficulties of other countries have since made us familiar; in brief, notwithstanding the opinion that obtained at the time—an opinion founded on defective observation—this attempted extermination of the pest resulted in failure, and it is certainly to Geelong as a centre of origin that the later contamination of other Victorian vine districts must be traced back.

In Victoria, as in South Australia, the various vine districts are separated one from the other by wide stretches of country under timber, grass, or cereals, and in consequence the early spread of the disease was necessarily slow; it is possible, too, that the assumed success of the Geelong operations had lulled growers into a state of false security, from which serious losses alone could possibly awaken them. At all events little or nothing was heard about the pest until 1893, when a new centre of infection was discovered at Bendigo. At this stage one might have expected that advantage would have been taken of the experience of other countries, and that no precaution would have been spared to restrict the new area of infection. Unfortunately, this is very far from having been the case, and whilst we cannot deny a liberal expenditure of the public funds we have again to chronicle the same slipshod, ineffective methods of treatment, the same neglect of the most elementary principles that the slightest regard for the interests of clean districts should have suggested.

A well-known nursery, contiguous with infested vineyards, if not actually infested itself, was allowed, without let or hindrance, to distribute plants, including vines, throughout the length and breadth of the State. On return from a visit to Victoria in 1895, and in a report to the then Minister of Agriculture (Sir J. A. Cockburn), I commented strongly on the apparent laxity of the Victorian authorities, as a source of danger to this State. Dr. Cockburn, however, refused to give publicity to the report, as he objected to my criticisms of the actions of a neighbouring State. I have it, however, on the authority of Messrs. Dubois & Wyatt, that the infection of Victorian districts subsequent to 1893 can be distinctly traced back to plants distributed from the Bendigo nursery in question. Chronologically, the discoveries of these later infections may be arranged as follows:—Heathcote, 1895; Toolamba and Ardmona, 1898; Rutherglen, 1899; and Tabilk, 1900. At the present time only three districts are described as free from the pest, viz.:—Great Western, Lilydale, and Mildura.

In 1899 it was generally felt that the phylloxera was getting out of hand in Victoria, and at the suggestion of New South Wales an interstate Conference was held in Melbourne, to consider the position of affairs. The majority of the members of the Conference took the view that the disease had got beyond control, and recommended in consequence the introduction of American vines and the building up of new vineyards on phylloxera resistant roots. For reasons that it is unnecessary to enumerate here I felt compelled to oppose this resolution, which, however, was duly passed, and subsequently acted upon by the Victorian Government. During my late visit to Victoria I was particularly anxious to ascertain what had been done during the last three years, and to what extent our interests were likely to be menaced in the future. I have gratefully to acknowledge that every facility was afforded me by the Victorian Department of Agriculture; and my special acknowledgments are due to Messrs. Dubois & Wyatt for their unfailing courtesy, and their willingness to help me in every direction.

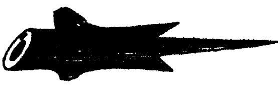
Rutherglen, one of the most important vine centres in the Commonwealth, was the district which I first had the opportunity of visiting. Here, apparently, the spread of the phylloxera has been slow, though sufficiently appreciable. Originally, in 1889, two centres of infection had been definitely recognised; at the present day the district can boast of 12 infested vineyards. At Rutherglen, as yet, there has been no replanting on American vines, the only grafted vines to be found within the district being those at the Viticultural Station, of which Mr. Dubois is the director. The growth of the vines in general appeared to me poor, and the yield far from promising. The rains that have fallen since my visit will probably tend to improve matters. It was quite evident, however, that tillage had been neglected throughout the district—a very questionable policy in a year of drought.

The attempted establishment of a special School of Viticulture having failed, the Victorian Government decided to transform the existing premises and land into a Viticultural Station. The movement was no doubt a wise one, and it is a matter of regret that it was not continued to a logical end. Unfortunately, the range of its operations has been restricted to extremely narrow limits; at present, apparently, it is little beyond a nursery for American vines. It seems almost inconceivable that, after vines had been planted, a cellar erected and equipped, the Director should not have been allowed, let alone encouraged, to carry on experimental work in connection with vines and wines which would have been of advantage to the industry as a whole. As a matter of fact, the cellar was empty at the time of my visit, every drop of wine having been disposed of in spite of Mr. Dubois' protestations; and the question of renting the college vineyard in the future had even been raised.

Mr. Dubois is to be congratulated on his work in connection with American vines; it can hardly be ascribed to him as a fault that greater advantage does not as yet appear to have been taken of it by growers of the State. He has cleared the ground and done much pioneering work, on which Victorian vineyards of the future will find firm foundation. Centuries of cultivation have endowed the numerous varieties of Vitis vinifera with the power of adapting themselves to the most extreme variations of climate and soil, and the more discriminating tastes of the American species have proved in the past sore stumbling blocks in the way of the uninitiated European growers. It might, perhaps, be argued that now that the results of well-nigh 30 years' accumulated experience have made the European grower better acquainted with American vines, the path of the Australian grower will be comparatively easy. Our conditions, however, can hardly be described as identical; nor can we accept European results without putting them to the test of definite experiment. In this connection the work achieved by Mr. Dubois at Rutherglen is full of interest. With him the varieties and hybrids of Vitis rupestris have undoubtedly proved most successful; amongst them he quotes Couderc's rupestris x riparia hybrid No. 3306, rupestris du Lot, rupestris Martin, and rupestris Ganzin. On the other hand, the ripariae have generally given less satisfaction. Neither the soil, nor the situation, of the station appeared to me particularly good, reminding me forcibly of some of our poorer stringy bark land; the climate is generally both dry and hot, and, without wishing to infer that sufficient time has as yet elapsed to definitely settle the question, it is a matter of congratulation to note that hitherto Mr. Dubois's results have been more or less in accord with general French experience. Should the experience of the next few years serve to confirm them, and should analogous ones be registered in different soils and conditions, we shall be spared a lengthy period of painfully halting experiments.

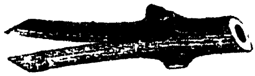
The rooted and grafted vines that are distributed over the different parts of the State are all reared at the station nursery. During the present season Mr. Dubois planted out 62,000 grafted cuttings, and, in spite of the dryness of the season and the absence of means of irrigation, there appeared to be fully 50 per cent. of successfully grown plants. The cuttings are bench grafted by hand as ordinary whip and tongue grafts, or else by the aid of a special piece of mechanism as "greffe a onglet" or "aglet graft." The stock

Fig. I



SCION

Fig. II



STOCK

Fig. III

AGLET GRAFT

is cut as a double sloping wedge with apex in the centre; it is subsequently split vertically along the median line. The scion is cut close below a bud to a long narrow tongue, supported on either side by two projecting flaps. The tongue of the scion is fitted into the vertical slit of the stock, whilst the sloping flaps cover the sides of the wedge. Mr. Dubois, who has tested several well-advertised grafting machines, states that this one alone has given him entire satisfaction, even when placed in the hands of comparatively inexperienced workmen. By its means three men averaged 2,000 grafts daily, whilst three of the most experienced hands did not succeed in putting together more than 1,000 whip and tongue grafts in the same time. From the workshops the grafts, that are solidly bound together with raphia fibre, are taken to the callusing boxes, in which union betwixt stock and scion is effected before planting in the nursery. Organic mulch appears difficult to secure at Rutherglen, and Mr. Dubois appears to have found a very good substitute for it in a layer of 3 or 4 in. of river sand. It is a pleasure to be able to testify to the very efficient manner in which the American vines appear to be handled at this institution, and I can but reiterate my regret that Mr. Dubois should latterly have found his energies restricted to this one line of experimental work.

Whilst in the district I took the opportunity of tasting the export wines of the principal cellars. The impression left on me is that, notwithstanding the expressed opinion of interested persons, our average export wines are both fuller and richer in colour; in alcoholic strength they appear to me about equal, whilst the Rutherglen wines show a greater tendency towards sweetness than our own. Whilst in the cellars it was a matter of surprise to me to note that practically nowhere is provision made for drawing off the new wines from the bottom of the vats by means of an opening of some kind; in all cases the new wine appears to be pumped up from above.

From Rutherglen, accompanied by Mr. Wyatt, I proceeded to Chateau-Tabilk. Here Mr. Burney, the manager, was good enough to show me over the vineyard and cellars. This vineyard consisted originally of 320 acres; the phylloxera appears to have been first discovered there in 1900, although it is probable that it had been there unbeknown some years previously. Since that time 25 acres have been uprooted, and another 40 acres are practically useless. It has been stated that the phylloxera had made but little progress on this estate; in the opinion of Messrs. Burney and Wyatt this is very far from having been the case. In fact, the yield of the vines is already on the down grade, which is a sure indication of an approaching end. The yield in 1900 amounted to 70,000 gallons, in 1901 to 75,000 gallons, and in 1902 to 65,000 gallons; whilst the yield for 1903 was estimated at 57,000 gallons at the time of my visit, providing a sufficient amount of rain should fall before vintage time. It is estimated here, that when situated in heavy land, vines practically succumb after the third year of attack; in the rich alluvial sands they appear able to resist the attacks of the phylloxera for a considerable time. The wines I tasted here were of good style and well finished, but in every respect thinner than our average export wines.

Whilst in the Goulburn Valley I took the opportunity of visiting the magnificent irrigation works established by the Victorian Government. I could not but help thinking that so long as we were not utilizing in a similar manner every running stream of which we are possessed, so long could the reproach be thrown at us that we were neglecting our opportunities and not making the most of our great natural advantages. There are many Ardmonas, veritable oases in barren wastes, that a better utilization of the Murray waters could call to life in our midst.

Here the growers of table grapes have not escaped the phylloxera scourge; it was pleasant to note an attempt at reconstruction on American vines. In this case the American cuttings were planted out ungrafted in situ; an attempt had been made at grafting them in the vineyard during the present season. Probably not more than 25 per cent. of the grafts had succeeded, and I am only able to record one acre of grafted vines at Ardmona. One grower had been exceptionally successful with winter flooding; his vineyard had been kept for six weeks under a constant layer of water 9 in. in depth. In the opinion of both Mr. Wyatt and the owner there was a great improvement in growth, and only where the water had failed to reach, owing to unevenness of the soil, were we able to discover any live phylloxera. Unfortunately, the increased vigour of growth had been accompanied by a bad setting of fruit.

From Ardmona I proceeded to Mooroopna, where I had the pleasure of meeting Dr. Florence (Chairman of the Co-operative Wine Company). The export wines produced here did not appear to me equal to our own. The cellars of the Company, although generally well conducted, somewhat surprised me in some details of arrangement. These cellars are of modern date, and I anticipated the adoption of practices leading to a minimum of labour. This can hardly be the case in a cellar in which the bulk of the wine appears to be stored in hogsheads. I was surprised to learn that these casks, once filled, are not touched until racked again. True, the casks are tilted on one side, so that the bunghole is not in contact with the ullage space, but it is idle to suppose that under our warm climatic conditions such a practice will deter germs of acetic acid from growing on the exposed surface. A long, rectangular tank, without any protecting cover, was pointed out to me as the blending tank; surely it hardly fulfils the conditions essential to such a vessel.

At Mooroopna is established a Government Experimental Nursery for American vines. Here it was evidently proposed to endeavour to discover the varieties best adapted to this and similar districts. I say "was," because such a project can hardly be seriously entertained at the present moment, as, in pursuance of a policy of general retrenchment, the nursery appears to have been completely abandoned, and alone an imposing signboard testifies to original good intentions. When the extreme capriciousness of American vines in their adaptation to soil and climate is borne in mind, it will be recognised that such experimental plots, instead of being curtailed and neglected, cannot be over-multiplied. Probably there would be no difficulty in securing from private owners in different parts of the State small plots of land, on which, in return for certain privileges, such experimental work could be conducted at a minimum of cost to the department.

The time at my disposal did not admit of visits to other vinegrowing districts. I had, however, ample opportunities of meeting those interested in the business, and I propose closing a somewhat long paper with a few remarks on the general state of affairs.

From our point of view, so far as the phylloxera is concerned, there is, perhaps, nothing new to note, beyond again recording a fact that cannot be too frequently adverted to—viz., that it behoves us to watch our borders with extreme care. Victorian vineyards are still officially inspected from time to time; but when a new centre of infection is discovered, beyond noting the fact and advising the grower as to the best course to pursue, nothing is done. In ten years' time probably not a vineyard will be free from the disease, and it must not be forgotten that the danger to our vineyards increases with every extension of the disease.

My general impression of the situation at the present moment is that vine-growing as an industry is in Victoria not only at a standstill, but inclined to lose ground. Every season is the witness of new acres thrown out of cultivation, and but little as yet appears to have been done to replace them. So far as I could ascertain, there are not more than 31 acres under grafted plants in the whole State—about 15 acres in their fourth leaf at Bendigo, about 15 at Tabilk in their second leaf, and about one acre at Ardmona in their first leaf. Nor does it seem probable that replanting on American stock is likely to take a more active turn in the near future. The position is one of considerable difficulty, which we cannot altogether view without concern. I heard it averred on all sides that, even under present circumstances, the prices paid by London buyers left too low a margin of profit to encourage those who had lost their vineyards to embark on the experimental venture of American vines for the special benefit of those who were doing their best to kill the industry. I do not anticipate that any except those the magnitude of whose interests absolutely fetters them to the business, are at all likely to replant unless some special measures are taken to improve the position of the home markets. From the purely selfish point of view, we might perhaps feel inclined to shed crocodile's tears over our neighbours' misfortunes; even from this the lowest of motives I am inclined to think that it were false policy to do so. Whatever benefit we may temporarily reap, in the long run we have no interest in seeing the area under vines in Australia reduced. I well understand that at the present moment we are somewhat overstocked with wine; but who is there that can deny that it is morally certain that we shall be understocked in four or five years' time? And what will be the consequences then? The export trade—and not the local or interstate trade—will suffer, and we shall be stigmatized as a country too much subject to fluctuations to render possible the establishment of definite and permanent business relations. To you who are aware how sensitive a thing is the wine trade, I need scarcely point out the consequences of such a contingency. And as we do not appear inclined to encourage further planting in our own State, let us hope that Victorians will find a way out of their present difficulties. I see but one way that is likely at all to prove effective, and that is that the Victorian Government, like our own, shall step in the arena, and help to further open out the London market. Victorian growers have a moral claim on their Government that we did not possess in 1894. From the best of motives, they were encouraged by the award of a bonus to rapidly extend their areas, and at the same time the spread of the phylloxera is not unconnected with administrative laxity. I notice already that in several centres growers are beginning to agitate in some such direction, and I trust—and I believe that you will be with me in this view—that the Government will see the equity of complying with a reasonable and just demand.

ORCHARD NOTES FOR FEBRUARY.

By Geo. Quinn, Horticultural Instructor.

The fruit harvest is now in full swing, and the packing of apples for shipment to London and elsewhere will begin during this month. In the initial years of our export trade packers were freely advised to pick the apples a few days before they were packed, so that the surplus moisture could evaporate from their skins, and thus toughen them. The main reason advanced for the adoption of this practice was the increased immunity from bruising which was thus obtained. When inspecting cases of apples which had, through lack of shipping space, been detained in the depot at Port Adelaide for two or three weeks, I have often been surprised at the slackness of the contents. Enquiries among the packers of such consignments lead me to conclude that the shrinkage was largely due to the evaporation which had taken place after the fruits had been packed. A case of fruit in which the contents are loose not only runs more risk in carrying badly but presents a very disparaging appearance when opened for inspection by prospective buyers in London.

The summer rains have helped the growth of the fruits, and most kinds will be quite up to grade when the first pickings are made to catch the early boats. Although of proved value to experienced exporters, beginners may not be aware of the advantages gained by making at weekly intervals three or four pickings from the trees bearing the varieties suitable for export. A little observation will soon convince one that small specimens left upon the trees at the time of the first picking will develop during three or four weeks into a good sample. It is difficult to explain how to detect when apples are mature enough to gather from the tree. A novice may take as a guide the browning of the pips, or the ready separation of the fruit stalk from the spur when the fruit is raised above a horizontal position. There are other indications of maturity, such as a partial transparency to the vision and a peculiar response to pressure, which readily convince the experienced grower, but are not fully transmittable in words. In earlier years packers were advised to place their fruits in rows in the cases, each one with the eye down or up. Later experience has taught that, providing the fruits are evenly graded, securely and neatly packed, buyers at the other end do not mind the direction of the "eyes" of the fruits. The woodwool used now is an advance upon the paper shavings, but some packers of apples appear to think that it is either cheaper or simpler to put in more woodwool and less apples. A little protection from the boards of the case, or the filling of a vacant space which is not sufficiently large to take another apple, offer legitimate uses for this packing material, but beyond these needs apples do not demand padding, and buyers in London want apples, not woodwool.

The large supply of moisture in the ground at present will give us fruits of unusual sizes. In the case of those sorts subject to "brown pitting" this will intensify the evil. It is well known that these "pits" develop rapidly after the fruits are gathered, and specimens on which scarcely a trace is visible at the time of packing will after a six weeks' voyage be quite valueless. The only method I can suggest to avoid this is to gather and store the suspected fruits for at least a fortnight prior to packing them.. At the expiration of this period the worst specimens, at any rate, will begin to show their true qualities, and may be rejected.

Wherever, owing to natural moisture, the sap is still active, or may be made so by irrigating, the present is an opportune time to insert buds. The practice is—as far as inserting the buds is concerned well known; but frequently important details are overlooked. The selection of buds from trees, or even branches of trees, of good, regular fruiting habits, is of primary importance. The beginner will be well advised if he refrains from starting these autumn-inserted buds into active growth. It can be easily avoided if the strings are slackened gradually so as not to constrict the swelling stem above the bud, and the top portion on the stock is left entire until all growth ceases for the season.

Summer pruning will be continued upon vigorous apple and pear trees. As the month progresses—in most districts, at any rate—the laterals may be cut off completely with a shears set to make rough sections. Where much moisture still stimulates the growth the partial fracture so frequently described in these columns will probably prove more satisfactory. Let me repeat again, this practice is meant to weaken the trees; consequently, trees of meagre growth should not be pruned when in foliage. It is applicable to strong-growing, shy-fruiting trees; but even with these the leaders should not be shortened until winter time.

The densely crowded heads of peachtrees may yet be thinned out with gain to the buds and shoots upon the lower and hitherto shaded parts of the tree. I do not suggest shortening any shoots, but rather removing completely those which can be spared.

Up till the time of writing the codlin moth caterpillars have not proved as destructive as in other years. This might have been anticipated, as a natural result of the almost complete failure of the apple crops last season. It is gratifying to note the more general adoption of arsenical spraying as a means of checking this pest. In some orchards where this work has been carried out systematically affected fruits are now the exception, where formerly they were the rule in point of numbers. Owing to such results, interested persons are again making preparations for extending their plantations, and others are proposing to enter the ranks of the apple growers of the State.

The larvae of most kinds of scale insects are now active, and the work of extermination can be more effectively undertaken than during the winter season. Two or three sprayings with resin wash given during the next couple of months will reduce the red scale pest of the citrus trees to a minimum. A good wash may be made by dissolving 10 lb. of common resin, 10 lb. washing soda, 5 lb. soap in sufficient, say, 15 gallons of water, and then diluting the product to make 50 gallons of wash for spraying. Trees upon which this is used should not be in need of moisture, as the foliage will suffer.

Young citrus trees may be lifted with safety now if a good ball of soil can be taken with them and the roots be preserved. Any trees treated thus should immediately receive a good soaking of water and a thick coat of mulch spread around over the soil, extending well beyond the spread of the root system.

Owing to the abundant crops of grapes small growers should dry any surplus for future use. Although any grape will make an indifferent rasin for home use, few of our table varieties other than the muscatel are worth drying. Prior to being spread out to dry these should be dipped for a few seconds in a solution kept pretty well at boiling point. This will crack the skins and facilitate the evaporation of the moisture. A good workable solution may be made by dissolving 1 lb. of caustic soda in 15 gallons of water. If only a few bunches are being dried they may be held by the stalks during the dipping, but a perforated kerosine tin bucket is a ready and cheaply made dipping vessel. Currants do not need dipping before being spread out to dry. The surplus plums should be treated similarly to the muscatels before they are spread out in the sun. They should be dipped in the hot solution and then into cold, clean water to remove the lye. The beginner usually dries his fruits too much. They should be left in the sun until squeezing will not cause them to exude their juice, but a thick jelly. Some will be drier than others, but if the whole be bulked in a box the dry ones will soon draw moisture from the others, and an even sample will be obtained.

NOTES ON VEGETABLE GROWING FOR FEBRUARY.

By Geo. Quinn, Horticultural Instructor.

On the plains, with water for irrigating purposes, sowings of peas should be made The soil should be well soaked a couple of days before being worked up. The drills being prepared a good sprinkling of fine bonedust or superphosphate should be spread in them before the seeds are sown. If the peas have been soaked in hot water to hasten germination they should not be sown directly upon the superphosphate, but a little earth should intervene. The actual contact of the manure with the soft soaked seeds tends to reduce their germinating powers. Cover them lightly with broken stable or farmyard manure. As very little tender green food is to be found now the sparrows must be kept away until the pea plants are grown to a tough stage. The best preventive in a small garden is afforded by stretching a thread of black cotton along above the drills, so that it just hangs clear of the soil. For these early winter fruiting peas the drills should be made running north and south, so as to equalize the sunlight. This precaution may seem unnecessary now, but is of considerable importance as the season progresses.

On well-prepared, loose, deep soil the first sowings of carrots and parsnips should be made now. The seeds should be drilled in and covered with light pulverized manure mixed with soil. No chemical manure is needed or of much advantage at the outset. If it be spread in the drills it tends to cause the main roots to send out a lot of fibres near the surface, and thus spoil the quality of the produce. Turnips may also receive a trial, and likewise prickly spinach, but these may not prove a success if the month turns out hot.

When a cool change sets in an effort should be made to set out young cabbage and cauliflower plants. If these have been grown well apart in the seed beds so that the root systems are fairly intact when lifted the results will pay for the trouble of thinning which has been practised. A good plan is to take a bucket, into which thin liquid mud is placed. The plants are carried with their roots in this liquid. When planting one person should go along the row with a dipper and pot of water, making the holes and filling them with water. The planter follows behind and transfers the roots of the plants quickly from the puddle in the bucket to the hole while yet a little water remains in it. No further immediate watering is necessary, but the dry loose soil should be drawn around the plants as soon as convenient.

The sowing of seeds of cabbage, cauliflower, lettuce, onion, celery, &c., in properly prepared seed beds will be necessary to maintain a succession of crops. The surfaces of such beds should be covered with finely broken manure, and they should be shaded in the day time with a lattice. Where winter frosts are rare early crops of potatoes should be set now in good rich soils. A dressing of bonedust along the trenches will help the plants along. The tubers should not be set deeply in the soil for this crop. The soil should be kept moistened by irrigation and the surface stirred at this point.

Tomatoes should be kept well supplied with water, but overhead sprinkling is not advisable. A mixture of superphosphate and sulphate of ammonia sprinkled around the plants and washed into the soil will keep them in good fruiting condition. Cucumbers, marrows, trombones, and pumpkins will benefit largely by the overhead application of water by means of sprinklers. This is, however, not desirable on stiff clay soils owing to the hardening and cracking of the surface. If this watering can be done before sunrise or after sunset the greatest good will result. Watermelons and sweetmelons do not appear to relish overhead waterings, and the water should not come too much in contact with the fruits.

Further sowings of dwarf beans should be made during this month. These will run well into the late autumn, and yield fine crops pretty well until the peas sown now are ready to gather. Red beets may be sown still, and at this period the long kinds will prove most profitable though less rapid in maturing than the turnip-rooted varieties. Rhubarb will need watering on the plains, or otherwise it will flag badly. The old seed stems of asparagus will probably be ready for cutting away. They should not be removed until quite yellow and mature, otherwise the roots will be weakened.

In cool spots salad plants, such as cress, mustard, radish, lettuce, &c., may be sown. These must never be permitted to get dry, or the tissues will toughen and the quality of the produce be reduced.

STOCK REPORTS.

By C. J. Valentine, Chief Inspector of Stock.

The following summaries of the Quarterly Reports of the Stock Inspectors are of interest to stockowners.

Mr. R. J. Needham, Deputy Chief Inspector of Stock for the Central Northern District, reports having inspected 191,000 sheep on farms, travelling, and at markets and sales. The flocks continue very free from tick and lice. Ophthalmia has been and is causing a good deal of trouble: in some cases whole flocks have become blind, and losses have occurred. Under favourable conditions the sheep recover their sight. In two valuable lots treatment was advised, and was successful. The contagious nature of the disease has been pointed out. Four sheep with cancer were destroyed. An outbreak of cuckoo scab occurred, and the owner advised how to treat the disease. Four thousand five hundred cattle were examined. Pleuro-pneumonia unfortunately broke out in an imported lot of cattle in different places: 257 cattle were quarantined, and nine quarantine notices issued under the Act. More than one-third of one lot have died. The deaths have ceased, and the precautions taken appear to have prevented the disease spreading. Only 15 cases of tuberculosis have come under notice—11 were destroyed, and four isolated for slaughter, 12 were dairy cattle and seven being milked. One case of cancer occurred in a dairy cow, which was destroyed. Two cases of actinomycosis were found; one animal was destroyed and the other isolated.

Impaction and paralysis continue to claim their victims, 30 cases having been dealt with during the quarter, and only six recovered after treatment. On one farm, where the ailment carried off three cows very quickly, an experiment was tried. The dam was fenced off, and the cattle were put on a slightly brackish well, and a ration of grain given daily. No more deaths occurred. Nine cases of rickets were seen, and the usual treatment recommended. No cases of disease in swine were seen or reported. The state of the country to the east and north-east has been improved by the late heavy rains, but more is wanted. One information was laid under the Brands Act, and a conviction obtained.

Mr. T. H. Williams, Inspector of Stock for the South-East District, reports inspecting 143,000 sheep, 86,500 of which were principally starving stock from Victoria; 5,500 were exported, 100 of which being rams for New Zealand. The general health of the sheep has been very good. Only a few deaths have occurred from worms. The majority of owners are now providing pure water for their animals, and a marked improvement in the health of the flocks is the result. In some localities, where sheep could only be kept a few weeks owing to the supposed coast disease, they are now kept the whole year through, and lambs are fattened. Lice have appeared in five flocks, which were dipped. One drover was fined for introducing lousy sheep, and 3,000 prevented from entering until dipped. A number of flocks were found with a few ticks on them at shearing, and owners have dipped. For introducing a flock badly infected the offender was fined. Six thousand six hundred cattle were inspected, 946 of which were dairy cows, 2,000 were imported, chiefly from the drought districts of Victoria, and 650 were exported. The general health of the herds has been good, and a continual improvement is noticeable where the animals are kept under improved conditions, and are provided with plenty of pure water. Only 17 cases of tuberculosis came under notice; 16 badly affected were destroyed, only four of these were cows in milk. Two were affected in the udders, and tubercle bacilli were found on slides prepared from the lesions. Two cattle affected with actinomycosis were reported—one was destroyed, and the other isolated for fattening, and is doing well. One cancerous animal was destroyed. Several animals were affected with local ailments. No cases of impaction were reported; 2,031 horses were introduced, and 154 exported. Have inspected about 640. One case of pyaemia occurred in a valuable animal, which died. Fines, one of £5 and costs and two of £10 and costs, were inflicted for breaches of the stock regulations. A breach of the Brands Act occurred, and a small penalty has since been inflicted.

Mr. H. A. Doudy, Inspector of Stock for the Southern and Central District, reports having inspected 93,800 sheep, 2,800 of which were imported from Victoria, 5,700 cattle, 1,700 horses, and 3,000 swine The sheep inspected were mostly in satisfactory health, but more or less infested with tick. A few were lousy. Sheepowners are becoming more alive to the manifest advantages arising from careful and regular dipping. Seven cattle were found actinomycotic, and were isolated; 24 with tuberculosis, 15 of which were killed and nine isolated. Four affected with cancer were destroyed. Pleuro-pneumonia appeared in one herd—nine were destroyed, and the herd of over 700 has since been inoculated and quarantined, 39 cows were victims to what is called impaction—three cows were apparently anaemic, and one died from hydatids. Horses examined were free from disease. The bot fly is becoming very troublesome all over the district, and owners are advised as to action to be taken. No contagious disease has been found in swine; 14 died from poisoning. There is reason to believe that considerable losses in swine are being sustained, arising from incautious and careless feeding.

Mr. R. L. Winkler, Inspector of Stock in the Northern District, reports the general health of sheep good, but the condition low, and many deaths have occurred from weakness. Have inspected about 22,000 sheep. A number are being trucked northwards, where, since the rain, feed is plentiful; 3,200 cattle from Queensland were inspected, only a few have had to be destroyed from tuberculosis and actinomycosis. Very few dairy cattle have been seen. In the hills a number of cattle are affected with tumours about the throat, showing symptoms of tuberculosis and actinomycosis There have been few reports of impaction. One report of red-water, for which treatment was advised; 12 cases of tuberculosis, 10 of which were destroyed and two isolated; eight cases of actinomycosis have been noticed, six destroyed, one isolated, and one is being treated with iodide of potassium. Only slight local ailments were seen amongst horses. At a slaughter yard 25 swine were found to have died. A post-mortem revealed tuberculous lesions; as they had been fed on raw offal, there was no doubt as to the cause of infection. The yards have been cleaned and disinfected. Complaints are made of camels on the Tarcoola track being affected with mange. Unfortunately, it is not easy to cope with the travelling camels, on account of the long distances, and the carelessness of owners and drivers. At Hergott they were found fairly clean, and the infected animals were dressed.

The officers travelled 10,500 miles on duty.

POULTRY NOTES.

By D. F. Laurie.

Artificial incubation in Egypt is thus mentioned in an American Consular report. The report describes the system of hatching eggs by artificial heat pursued in that country from time immemorial, and still in active operation. One establishment visited by the Consul-General was wholly constructed of sun-dried bricks, mortar, and earth. It was 70 ft. long, 60 ft. wide, and 16 ft. high, and was provided with 12 compartments or incubators, each capable of hatching 7,500 eggs, or altogether 90,000 at one time. The season begins in March and lasts until May, and three batches of eggs are hatched in this time, each taking an average of three weeks. The fourth week is given to removing the chickens, and preparing the incubators for a new batch of eggs. The number of eggs treated at this establishment in a single season was, therefore, 270,000, from which 234,000 chickens are usually obtained. The percentage of chickens would be greater, but that the eggs are in some instances procured from long distances and in large quantities, and are therefore liable to damage. The price of eggs is 2½d. per dozen, and chickens just issued from the shell are sold at 7½d. per dozen. The loss of chickens after incubation is comparatively small. The whole staff of the place is a man and a boy, who keep up the fires to a temperature of not less than 98 degrees Fahrenheit, arrange the eggs, move them four or five times in the 24 hours, look after the chickens, and hand them over to the buyers. The number of chickens hatched in this manner throughout Egypt is estimated at 75,000,000, and would, under ordinary circumstances, require 1,500,000 mothers.” Artificial incubation was known and practised in England during the seventeenth century, and the knowledge may have been imparted by travellers from the East.

At this season of the year there is a good deal of work in the poultry yard which requires attention. It is poor policy to leave everything for the breeding season, when the days are short, and many things claim attention. The young birds are growing, and some are fit for disposal. These should not be kept a week longer than necessary, as the cost of feeding is great, and there is no compensating advantage. Where high-class stock is bred the inferior specimens should be culled out, so as to give more space for the good ones to grow. Where egg-production is the main feature the cockerels should be disposed of, reserving a few of the best of known pedigree (if pure bred) for breeding from next season. Alterations and additions to yards and houses should be attended to, and where possible the soil should be broken up and left to sweeten. Chicken coops and hatching pens (if used) should be prepared. Give particular attention to the drinking water, and keep same well shaded. Keep the yards scrupulously clean, and use disinfectants in houses and around the doorways and gates, which are often points of infection. Get some ground prepared for early crops of green food, rape, &c.; a plentiful supply will promote health and early laying. Destroy vermin of all descriptions. Tick, if prevalent, can easily be destroyed with perseverance—there is no necessity for all the outcry about difficulty of eradication. One thing is certain, that insect and other pests require something more than a mental anathema to encompass their destruction, and half-hearted attempts are quite useless.

Finely chopped green vine leaves may be fed to ducks and ducklings with advantage; the tanin therein is a preventive of bowel disorders. Keep ducklings in low, thatched sheds; they suffer if exposed to the hot sun.

Recent advices from England speak of the Partridge Wyandotte as the success of the season; it is a magnificent show bird, and a splendid layer. My own experience is very satisfactory, and I intend to breed a large flock. The old English Game have more than fulfilled this promise, and are grand performers in every way. The shipments from Sydney have been large this season, and it is stated that stocks have run down to a low ebb This is partly due to the high price of feed. This latter cause will reduce stocks throughout Australia, and in consequence prices will be high next season Those in want of stock should lose no time, as they may find all the good birds disposed of. I am most anxious to see a good beginning of an export trade, and hope that some of my readers will be able to combine to send a trial shipment; the time is at hand, as the birds should even now be on their way. If birds of good quality and properly fattened are sent excellent prices will result. Canada has proved this in the face of fierce competition. The birds sent from here will arrive at the dear season, and will not require to be stored, as is the case with Canadian goods, during a glut. Full information can be obtained from the Manager of the Produce Depot, Adelaide.

DATES OF MEETINGS OF BRANCH AGRICULTURAL BUREAUX.

With a view of publishing in the "Journal" the dates of meetings of the Agricultural Bureaux, Hon. Secretaries are requested to forward dates of their next meeting in time for publication.

Branch.	Date of Meeting.		Branch.	Date of Meeting.	
	1903.	1903.		1903	1903
Balaklava ..	Feb. 14	Mar. 14	Mount Remarkable	Feb 12	Mar. 12
Booleroo Centre ..	10	10	Nantawarra .	11	11
Burra ..	13	—	Narridy .	21	—
Caltowie ..	9	—	Norton's Summit .	6	13
Cherry Gardens ..	10	10	Onetree Hill .	6	13
Clare ..	6	13	Penola ..	14	14
Davenport ..	5	—	Port Elliot ...	21	21
Finniss ..	—	2	Port Lincoln ..	20	20
Forest Range ...	12	12	Pyap .	11	11
Gawler River ..	6	13	Reeves Plains .	6	13
Gladstone ..	14	14	Rhine Villa .	6	—
Hartley ..	13	—	Riverton ..	7	7
Inkerman ..	—	—	Saddleworth ..	20	20
Johnsburg ..	7	7	Stansbury .	7	—
Kanmantoo ..	6	13	Strathalbyn ..	16	16
Kapunda ..	7	7	Swan Reach .	14	—
Kingston ..	7	7	Wandearah ..	9	9
Koolunga ..	12	12	Willunga ...	7	7
Maitland ..	7	7	Wilmington	11	11
Morgan ..	7	—	Yankalilla ..	—	2
Mount Bryan East ..	14	14	Yorketown ..	14	—

COUNCIL OF AGRICULTURE.

The monthly meeting of the Council of Agriculture was held in Adelaide on Wednesday, January 28, the whole of the members being present.

The Secretary reported that over 2,000 copies of circular asking for information re cattle complaints had been sent out to the Branches of the Agricultural Bureau; and, further, copies would be sent to any stockowner applying for same. It was decided that recipients of circulars be asked to return same to the Secretary for Agriculture not later than March 15.

On the motion of Mr. Molineux, it was decided to ask the Hon. Minister for Agriculture to endeavour to make arrangements with the Public Works Department to permit of a portion of Mr. D. F. Laurie's time being available for work in connection with the Department of Agriculture.

Mr. Yelland thought that in view of the large development of the export trade in eggs, and the possibilities of opening up a trade in table poultry, the department should endeavour to foster the industry more than in the past. A competent poultry expert should be attached to the department. Mr. Sandford agreed, and referred to the fact that a very large number of farmers in the drought-stricken areas had only been able to keep going on the proceeds of their fowls.

Some discussion took place on harvest results at Roseworthy College Farm. It was decided to recommend that the College be connected with Gawler by telephone.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Compy report on February 2:—

Excepting during its last few days, January was unusually cool for that month. A couple of nice rains fell, freshening up feed in some places, and helping to fill out the late grain and fruit crops. The grape yield promises to be good, and prospects generally are favourable. The drought is usually spoken of as having broken up, but it must be remembered that nothing at all is being reaped off the dry areas, where the season shows a total failure for cereals, and although dams and tanks have been replenished, and the outlook is more favourable, agriculturists in those parts have yet had no substantial benefit from the changed condition.

The good prices ruling for most farm produce is causing a better commercial outlook in the city, and in such country districts as have been blessed with fair crops. There is a decided improvement in the mining share market, and the public are finding money to fit out a number of exploration and prospecting parties to search for metals, which, it is hoped, will help to revive the mining industry, and not result only in a paper boom on the Mining Exchange, as has too often hitherto been the only effect.

Though at the moment there is a lull in breadstuffs in London, the European markets are beginning to feel the influence of the unusual demand for wheat and flour from Australia and South Africa through values in Canada, United States, and Argentine having displayed persistent upward tendency during the past month. The shortage in Australia is every day becoming more apparent, and further orders being cabled to the American wheat-producing centres. Already about half a dozen vessels have reached Sydney, some of the wheat being transhipped to Melbourne. For the first time, also, for a generation, American flour is being sold in Adelaide, but meanwhile, demand from the east for South Australian wheat continues unabated. Melbourne, however, has been the market most ready to pay advancing rates, their American purchases not yet being due. Practically no country wheat is reaching the Victorian capital, all being needed locally, and Melbourne millers are therefore depending on importations. While the market for wheat at present continues in an excited condition, flour has not fully participated in the activity, as buyers for export are disinclined to pay wheat equivalents which millers here naturally ask. Local trade is of ordinary character, excepting that no extensive contracts with bakers have been made this year, buyers and sellers showing disinclination to speculate forward. In forage lines generally a firming tendency developed during the month, farmers now demanding more for their hay and showing less desire to quit. A good deal of chaff has been shipped to Sydney in execution of previous orders, and there is also a fair local demand. In millers' offal bran is cheaper, and at moment decidedly weak, though considerable deliveries are being made in execution of sales at the high rates ruling at beginning of year. Pollard is firm, and has strong export demand at present quotations. Oats are being freely delivered, but market has firmed up under the influence of heavy buying orders for South Africa. Cape barley also has participated in the improved conditions. Divergence of views between buyers and sellers as to opening prices for malting barley caused a slight lull, but trade is now being done at rates fairly satisfactory to producers.

In potatoes the market has been fully supplied with the late crop of locally grown, which this season are plentiful and of prime quality. A few trucks of Mount Gambier "earlies" coming forward to the city soon after the new year caused market price to drop heavily, and there does not seem any prospects now of recovery; but Gambiers are finding quittance in country districts, and meeting with good opening sales. Supplies of onions from the Adelaide Plains are showing signs of becoming exhausted, but the Hills crop is coming along and reported to be turning out a very fine sample.

In dairy produce the most noticeable event of the month has been the very unsatisfactory position in the butter trade, owing to the heavy holdings by speculators, who bought heavily during the spring months. The effect at the time was to maintain prices just sufficiently above equivalent European value, so that export trade almost entirely stopped for a while, and cold storage accommodation in Sydney, Melbourne, and to a lesser extent in Adelaide, was taxed to find space for the large quantities sold and unsold that were retained instead of being shipped off. Heavy production, especially in Victoria, proved too strong, however, for speculators, so that market had to give way, and some relief has been found since in the resumption of shipments to London. The market there is not in a satisfactory condition for Australian butter, the trade being advised from this end not to expect much, if any, this season, having made provision by securing supplies from Russia and America, where the yield has been abnormally heavy. Speculators in Australia are, in consequence, sticking to their stocks, of which it is reckoned 2,500 tons are held in Melbourne alone, besides large storings at Sydney, and a few thousand boxes in Adelaide. An attempt has again been made to force up price in the two eastern cities mentioned during the past few days, where a halfpenny rise is reported; but in face of the above position there is not much prospect of any substantial advance in price this side of winter. Values in Adelaide eased a penny during January, but are likely to recover soon. Sydney has been buying largely in eggs here this season; in fact, is the chief factor in realizing the satisfactory high averages obtained, so it is not to be wondered that our market has largely followed the movements of our neighbour in this line. After advancing here to 9½d., values about middle of month eased back 2d., but have since resumed the up-grade, and at moment are advancing. The receipt of heavy shipments of frozen pork at Sydney from San Francisco has further depressed the bacon market, with a corresponding fall in the raw material. A rapid fall in value of cheese in Victoria was quickly reflected here, showing again how much now the Australian markets control each other under free interstate conditions. Honey also weakened, but demand has been stimulated. Almonds are quiet.

In poultry very fair prices have been obtained for well conditioned table stuff, but the market has been over-supplied with fattening sorts, which realized low rates, owing to the high price of feeding stuff.

MARKET QUOTATIONS OF THE DAY.

Wheat.—At Port Adelaide, shipping parcels, 5/10 f.o.b.; farmers' lots, 5/8 on trucks, per bushel 60 lb.

Flour.—City brands, £11 15/ to £12; country, £11 5 to £11 10/ per ton 2,000 lb.

Bran, 1/5½; pollard, 1/9 per bushel of 20 lb.

Oats.—Local Algerian and dun, 3/2 to 3/5; prime stout feeding whites, 3/6 to 3/8 per bushel 40 lb.

Barley.—Malting, 4/6 to 4/8; Cape, 3/6 per bushel 50 lb.

Chaff.—£5 to £5 5/ per ton of 2,240 lb., bags in, dumped, f.o.b. Port Adelaide.

Potatoes.—New locals, £4 to £4 5/ per 2,240 lb.; Gambiers, £4 per 2,240 lb.

Onions.—Local, £3 to £3 10/ per 2,240 lb.

Butter.—Creamery and factory prints, 11½d. to 1/; private separator and best dairy, 10d. to 11d.; well graded store, 8½d. to 9½d. Victorian bulk, 10d. to 11d. per lb.

Cheese.—S.A. factory, new, 5½d. to 7½d.; prime matured, 8d. per lb.

Bacon.—Factory, cured sides, 9½d. to 9¾d.; farm lots, 7½d. to 8d.

Hams.—S.A. factory, 10½d. to 11½d. per lb.

Eggs.—Loose, 8¼d.; in casks, f.o.b., 10¼d. per doz.

Lard.—In bladders, 7½d.; tins, 7d. per lb.

Honey.—2½d. for best extracted, in 60-lb. tins; beeswax, 1/0½ lb.

Almonds.—Fine soft shells, 4½d.; kernels, 9d. per lb.

Above quotations, unless when otherwise specified, are duty paid values on imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of January, 1903:—

Adelaide	0·87	Manoora	0·60	Macclesfield	0·99
Hawker	0·34	Hoyleton	0·57	Meadows	1·15
Cradock	0·32	Balaklava	0·62	Strathalbyn	0·85
Wilson	0·40	Port Wakefield	0·65	Callington	0·47
Gordon	0·38	Saddleworth	0·64	Langhorne's Bridge	0·65
Quorn	0·46	Marrabel	0·68	Milang	0·95
Port Augusta	0·20	Riverton	0·69	Wallaroo	0·67
Port Germein	0·64	Tarlee	0·81	Kadina	0·64
Port Pirie	0·39	Stockport	0·71	Moonta	0·60
Crystal Brook	0·20	Hamley Bridge	0·55	Green's Plains	0·37
Port Broughton	0·50	Kapunda	0·75	Maitland	0·57
Bute	0·41	Freeling	0·59	Ardrossan	0·45
Hammond	0·30	Stockwell	0·53	Port Victoria	0·58
Bruce	0·41	Nuriootpa	0·71	Curramulka	0·55
Wilmington	0·55	Angaston	0·78	Minlaton	0·44
Melrose	0·78	Tanunda	0·68	Stansbury	0·35
Booleroo Centre	0·56	Lyndoch	0·54	Warooka	0·32
Wirrabara	0·37	Mallala	0·82	Yorketown	0·51
Appila	0·51	Roseworthy	0·43	Edithburgh	0·56
Laura	0·46	Gawler	0·70	Fowler's Bay	1·40
Caltowie	0·35	Smithfield	0·52	Streaky Bay	0·88
Jamestown	0·36	Two Wells	0·74	Port Elliston	0·62
Gladstone	0·34	Virginia	0·65	Port Lincoln	0·60
Georgetown	0·43	Salisbury	0·55	Cowell	0·47
Narridy	0·24	Tea Tree Gully	0·83	Queenscliffe	0·52
Redhill	0·22	Magill	0·98	Port Elliot	0·81
Koolunga	0·32	Mitcham	0·90	Goolwa	1·13
Carrieton	0·44	Crafers	1·32	Meningie	0·90
Eurelia	0·42	Clarendon	1·13	Kingston	1·28
Johnsburg	0·38	Morphett Vale	1·02	Robe	0·88
Orroroo	0·31	Noarlunga	0·63	Beachport	1·00
Black Rock	0·35	Willunga	0·98	Coonalpyn	0·94
Petersburg	0·27	Aldinga	0·88	Bordertown	0·84
Yongala	0·28	Normanville	0·83	Wolseley	0·69
Terowie	0·30	Yankalilla	0·67	Frances	1·04
Yarcowie	0·25	Eudunda	0·59	Naracoorte	1·18
Hallett	0·25	Truro	0·55	Lucindale	1·34
Mt. Bryan	0·49	Mount Pleasant	0·72	Penola	1·50
Burra	0·35	Blumberg	0·74	Millicent	1·39
Snowtown	0·41	Gumeracha	0·78	Mount Gambier	2·45
Brinkworth	0·30	Lobethal	0·85	Wellington	0·98
Blyth	0·70	Woodside	0·62	Murray Bridge	0·75
Clare	0·74	Hahndorf	1·09	Mannum	0·53
Mintaro Central	0·59	Nairne	0·75	Morgan	0·15
Watervale	1·00	Mount Barker	0·84	Overland Corner	0·26
Auburn	0·83	Echunga	0·95	Renmark	0·09

AGRICULTURAL BUREAU REPORTS.

Davenport, January 8.

Present—Messrs. Trembath (chair), Lecky, Hodshon, Brown, McDowell, and Pybus (Hon. Secretary).

Onions for Market.—Mr. Hodshon read a lengthy paper on this subject. He strongly advised oniongrowing for blockers. They were easily grown, yielded good returns if properly looked after, and did not involve much labour or expense. Onions would stand a considerable amount of heat if the ground was moist, but were susceptible to injury by strong winds. In exposed positions it would, therefore, be necessary to grow windbreaks. Patches of barley or rye could be sown for this purpose. Land for onions should be in good heart and well drained. Most soils, if well prepared, will produce good crops. Deep and thorough cultivation of the land was necessary, and every effort should be made to get the land as clean as possible before planting, as it will save a lot of labour later on in weeding. Extra Early Globe was one of the best of the early sorts; for second crops Brown Globe was recommended; and, for keeping purposes, Longkeeping Brown Spanish was unsurpassed. In this locality the first should be sown from April to June, Brown Globes from May to June, and Spanish from July to September. Onion seed should be sown, in drills from 9 to 10 in. apart, and to a depth of from 1 to 2 in., so that they will be well covered. The land should be harrowed lightly a few days after sowing. A home-made harrow would prove suitable in the absence of this foreign-made article. The "man harrow" is constructed of 2½-in. battens in triangular form; the battens 5 ft. long, and teeth made of 6-in. wire nails or fencing wire; the cross battens 4½ in. apart; the teeth arranged so as to alternate on the side angles. Harrowing could be continued when required for three weeks after sowing for weed destruction; the harrow should follow the line of drills. The advantages of sowing in drills were self-apparent—easy accessibility for hoeing purposes, less expenditure for seed, and heavier yields were some of them. The land should be kept free from weeds. The crop should be in a condition to stand until ripened after two hand weedings and two or three hoeings. When ready for harvesting the tops change colour and fall down. Onions keep best if not too ripe when harvested. In harvesting the bulbs should be placed in rows—pulling two rows and then placing the bulbs from four rows on each side on top of the initial row. They can remain until the tops will part easily from the bulb. Care should be taken not to expose them too long after they are ready for stripping, as they may roast if the heat is excessive.

Poultry Complaint.—Mr. Pybus showed young turkey suffering from a deformity of the leg. Quite a number of birds in this district have developed this weakness lately. In-breeding, injudicious breeding from young birds, and rheumatism were suggested as contributing causes.

Clarendon, January 12.

Present—Messrs. Piggott (chair), Phelps, Morphett, Hilton, Dunmill, Wright (Hon. Secretary), and one visitor.

Officers—Messrs. J. P. Juers and J. Wright were elected Chairman and Hon. Secretary respectively.

Water Conservation and Irrigation.—Mr. A. L. Morphett read a paper on this subject. In the hills there were numerous localities where water could be conserved in dams at comparatively little expense, and crops grown irrigation had been neglected, but the residents might well follow the example set in other localities. In various gullies and on the hill slopes water could be conserved in dams at comparatively little expense, and crops grown throughout the summer. It was surprising the amount of greenstuff that half an acre of land, well cultivated and irrigated, will produce. By growing such crops they could probably carry more stock on one section of land than they do at present on two. It would be better in the end to spend a little money in water conservation and irrigation, to more fully utilize the land they now held, than to increase the size of their holdings.

Mylor, December 13.

Present—Messrs. Neilson (chair), Hughes, Bradley, Mundy, E. J. and T. G. Oinn, and Clough (Hon. Secretary).

Planting Fruit Trees.—Mr. T. G. Oinn stated that he was not correctly reported in last month's report dealing with this subject. He advocated planting fruit trees early in the winter, and would apply three or four handfulls of bonedust annually to each tree.

Codlin Moth.—Members urge all growers in this locality to use their best endeavours to keep the codlin moth in check.

Fallowing.—Mr. Mundy read a paper on this subject. He strongly advocated fallowing in the south. To clean the land of weeds, fallow early, to give the weeds a chance to germinate, and then destroy them with scarifier or cultivator. If the land is fairly clean and is to grow a crop of hay August will be early enough to fallow. Mr. Neilson advocated well working the fallows, but the other members preferred to leave it rough, and break it down fine in the autumn.

Morgan, December 13.

Present—Messrs. Windebank (chair), Hausler, Wohling, Pope, Plummer (Hon. Secretary), and one visitor.

The Murray Swamps for Irrigation.—Mr. Wohling read a paper on this subject. He thought it would be a good plan for several farmers in the neighbourhood to combine to take up a block of land along the river, where there were some swamps and lagoons, and work it together. In a good season they could cultivate their own land first, and put in the lagoon afterwards. If only 20 acres to 30 acres each of such land could be cropped, it would ensure horse feed. With these lagoons, and the use of water, it was possible to grow several cereal crops in one year, also to get an early cut for hay, and a crop of wheat from the second growth. This year there were a number of small patches of very good crops along the river, and in addition plots of maize, rape, and lucerne were very promising. He was convinced that irrigation of these lands would prove profitable. Mr. Hausler had irrigated wheat three feet high; it was sown on the swamp land in October, and promised a return of 12 bushels per acre. He could water his swamp for less than £1 per acre, and thought Mr. Wohling's suggestion a very good one.

Lipson, December 13.

Present—Messrs. Brown (chair), George, Caleb, and Charles Provis, Ba'llie, Broughton, Wishart, Barraud (Hon. Secretary), and three visitors.

Wheat Experiments.—Mr. Caleb Provis tabled sample of Steinwedel wheat weighing 67½ lb. to the bushel, also Silver King, wheat in the straw. Mr. Charles Provis tabled Majestic wheat, which he considered a promising rust-resistant variety. From a small quantity received from the Bureau, he got 1¼ lb. the first year, this yielded 80 lb. the second year, and from this he reaped 3½ bags. Seed was sown on May 2, and the crop harvested on November 28.

Smut in Oats.—Members agreed that oats and barley require a stronger pickle than wheat to secure freedom from smut. Mr. Brougham stated that a farmer who sowed oats that were pickled the previous year, but kept over, found this portion free, while the crop from newly pickled seed was affected.—[The hot water method is the only one really effective against barley or oat smut.—Ed.]

Kingston, December 6.

Present—Messrs. Redman (chair), McBain, Clarke, Pinkerton, Fraser, E. M. and R. Flint, Goode, Barnett, and Wight (Hon. Secretary).

Licensing of Stallions.—Some members advocated the proposed tax on stallions; others thought it premature. The establishment of Government stud farms to encourage horse breeding was suggested by Mr. Flint. The Hon. Secretary thought the country shows had lost their value, as an aid to the improvement of stock, as prizes were often awarded to unworthy exhibits. It was decided to take a vote at next meeting.

Destroying "Yackas."—Mr. Fraser asked whether it was likely that the machine for injecting poison into prickly pear leaves was likely to be effective in destroying the Yacka (Xanthorrhoea).

Mount Bryan East, December 20.

Present—Messrs. T. Wilks (chair), Honan, Bryce, Thomas, Pohlner, Dare, Teddy, E. S. Wilks (Hon. Secretary), and one visitor.

Sheep.—Considerable discussion on sheep breeding took place. Most of the members considered it unprofitable to keep a ewe for breeding after five years of age.

Flood Gate.—Mr. Dare described a gate across a creek which seemed very effective. A strong chain was stretched across the creek from a post on either side, and light wooden bars were suspended from every other link.

Quorn, January 10.

Present—Messrs. Thompson (chair), Herde, Cook, Patten, Brewster, Walker, and Noll (Hon. Secretary).

Poultry Tick.—Messrs. Cook and Walker had found that boiling soapsuds applied to the roosts, posts, crevices, &c., in and about the fowlhouse proved an effective remedy for tick. The water from the weekly washing applied hot was used. The Chairman called attention to recommendation in Journal of Agriculture to dip the fowls in kerosine emulsion.

Lime for Cattle.—Mr. Brewster stated that as his cows were always chewing bones he came to the conclusion that they required lime. To test this he put a quantity of lime in his dam, and has found that since doing this the cows do not bother about bones. The lime also cleared the water. The Chairman advised the use of rock salt and lime where stock drank only rainwater.

Straw for Stock.—Mr. Walker doubted the value of straw for stock; losses of horses had occurred, and on opening one lumps of undigested straw were found in the intestines. Salting the straw in stacking was advised, or else adding salt to the straw when chaffing it. The Hon. Secretary found that when wet or damp straw got very tough, and was dangerous to stock; it should always be kept dry. With the addition of a little green food straw was very useful. When chaffed it should be mixed with hay chaff, bran, or molasses.

Maitland, January 3.

Present—Messrs. Smith (chair), Hill, Wilson, Jarrett, Bowman, Moody, Tossell, and Bowey (Hon. Secretary).

Honorary Members.—Mr. Tossell advocated the appointment of honorary members in connection with the Bureau. He believed it would be a success, and would result in extending the usefulness of the Bureau. It might be confined to members of not less than five years' standing who wish to retire from active membership but to retain their connection with the Bureau. Further discussion postponed.

Millicent, December 4.

Present—Messrs. Stuckey (chair). Hart, Oberlander. Hutchesson, Mutton, Holzgrefe. Campbell, McRostie, Varcoe, Davidson, and E. J. Harris (Hon. Secretary).

Field Trial.—It was decided to endeavour to arrange for field trial of various ploughs and cultivating implements about March.

Burning Scrub.—Mr. Holzgrefe thought it a mistake to burn rough country early in summer, better results would be got in March, and there would be less chance of good grass country being fired and fences destroyed. Members thought that an effort should be made to secure an amendment of the Bush Fires Act, as the months fixed in the Act for burning were unsuitable to south-eastern conditions.

Homestead Meeting.—This meeting was held at Mr. Harris's residence, members being accompanied by their wives, and after formal business was concluded an inspection was made of the stock, &c. A few acres of Napier Fescue (Festuca elatior) showed splendid growth, but Mr. Harris said his sheep would not eat it. Mr. Hart found his stock took readily to the fescue. A fine lot of young turkeys, fowls, and ducks were seen, but Mr. Harris said he found great difficulty in disposing of poultry at remunerative prices. Clarke's patent feeder for calves was inspected with interest, all the food being taken by the calf through a large rubber teat. Mr. Harris was well satisfied with the use of the feeder, as the calves do not swallow the food so hurriedly as with the old system.

Johnsburg, December 13.

Present—Messrs. Potter (chair,) Luckraft, Buchanan, McRitchie, and Johnson (Hon. Secretary).

Increasing Usefulness of Bureau.—Paper read at Officers' Conference was discussed. Most of the suggestions in the paper were approved of; it was decided to hold special meetings once a quarter in the evening, the ordinary meetings being held on Saturday afternoon. Members do not approve of suggestion to charge for the Journal of Agriculture. They thought that the establishment of Agricultural libraries in country districts, as suggested in the paper, would be of considerable value to the farming community. It was decided to draw up a programme of subjects for discussion, and that each member should take it in turn to initiate a discussion or read a paper.

Booleroo Centre, January 12.

Present—Messrs. Clack (chair), Arthur, Steven, Murdoch, Michael, Sargent, Repper, McMartin (Hon. Secretary), and two visitors.

Green Fodders.—Mr. Sargent enquired whether rape or mustard would be suitable for early green feed in this district, and also whether they were likely to become a nuisance. [With early rains either should flourish if the land is well prepared. So long as the seed is not sown too deep and the plants not allowed to go to seed they will not foul the land.—Ed.]

Cancer in Horse.—Mr. Michael had destroyed a horse suffering from what he thought was cancer in the eye, as he was afraid other horses might become affected. Dr. Steven thought infection might be conveyed to other animals from a discharging cancer.

Impaction.—Mr. Michael had lost five cows from impaction, and would like to know of a remedy. The Hon. Secretary would like to know cause of complaint; he had always found on opening the cattle that the gall was very full of bile. [This subject has been frequently referred to in The Journal. Our knowledge of the cause and cure is not altogether satisfactory, and further enquiries are being made. The article on page 369, of December, 1902 issue, is worth careful reading.—Ed.]

Port Elliot, January 17.

Present—Messrs. McLeod (chair), Inglis, Nosworthy, Green, W. E. and W. W. Hargreaves (Hon. Secretary).

Selling Eggs by Weight.—Members favoured the adoption of this system of disposing of eggs.

Annual Report.—Meetings held, 12; average attendance, 9; papers read, 7; homestead meetings, 4. Conference of southern branches was also held. The meetings during the past year have generally been very interesting. Officers re-elected.

Poultry.—The Hon. Secretary read a paper on this subject. While nearly every farmer keeps a few fowls, there were but few poultry farms. The farmer's fowl was too often left to look after itself; many farmers apparently holding the opinion that on the farm one fowl was as good as another. This was, however, a great mistake; to make them really profitable the breeding and feeding must receive as careful attention as was given to horses, cattle, and other stock. There was no fear of the market for good table poultry, or for eggs, being overdone. For table purposes they must raise a bird that matures quickly; for laying fowls producing 12 dozen to 15 dozen eggs per annum were required. Proper yards and houses must be provided, the chickens must be reared where they can be properly looked after and fed apart from the old hens. It was a mistake to rush into poultry keeping; start with a small flock, and as you gain experience increase the stock until the limit of profitable use of the land, &c., available is reached. For laying he found the Minorca and Leghorn, pure and crossed, very good, but they were useless for the table. A good all-round bird resulted from the Wyandotte or Langshan hen crossed with a Minorca rooster. For table the Indian Game-Dorking cross gave him the best results, as they mature quickly and produce weighty birds at a few months. Farmers must remember that for table purposes, the fowl that matures quickest is most profitable. As soon as they are ready for market they should be disposed of, the longer they are kept afterwards the less the profits. With proper care and attention there should be no serious losses from disease, &c. The keeping of old hens, want of cleanliness in the houses, improper feeding, and sunheated water are responsible for most of the losses in poultry farming.

Homestead Meeting.—Meeting was held at the Chairman's residence. A splendid crop of amber cane was seen on the site of an old piggery on the top of a dry hill. The trees and vines in the orchard looked well; the currant vines were loaded with fruit, and proved the correctness of Mr. Thomas Hardy's statements as to the suitability of this part for the production of currants and raisins. A potato patch, with growth 3 ft. high, strong and healthy in appearance, promised well. On digging them up scarcely any tubers were found. Members would like to know how to account for this. The Chairman stated that the land had plenty of manure, and the seed was the best he had ever planted; the crop is on black soil near a creek.

Penola, January 10.

Present—Messrs. Stoney (chair), Miller, Wilson, McKay, Worthington, Peake, Richardson, Maxwell, Kilsby, Darwent, and Dr. Ockley (Hon. Secretary).

Barley Growing.—Mr. H. Ricketts enquired as to constituents taken out of the ground by a crop of barley; also the most suitable manure for barley, and what crop should follow. He had sown barley two years in succession, but the second crop was a failure. The Hon. Secretary said good samples of malting barley were seldom grown two years in succession on the same land. Rotation of crops would be necessary, and they would have to find out what would best suit local conditions. He suggested sowing 2 ℔. Dwarf Essex rape and 1 ℔. white mustard seed per acre on the stubble, then feed off with sheep, stocking heavily, and plough under the second growth for green manure.

Nantawarra, January 7.

Present—Messrs. J. Nicholls (chair), R. Nicholls, Billing, Dall, E. J. and A. F. Herbert, Pridham, and Dixon.

Destruction of Timber.—The destruction of valuable timber on the travelling stock road was generally condemned by members. Mr. Pridham thought it would be a good plan to grub the small undergrowth on the roads, as it was only a harbour for vermin.

Destruction of Rabbits.—Mr. Nicholls had used "toxa" very successfully to destroy rabbits; the baits were dropped from a stick, to avoid handling, on to freshly broken ground.

Eudunda, January 12.

Present—Messrs. Gosling (chair), Paech, J. and E. T. Pfitzner, Krummel, Lampard, Weil, Hucks, Kluske, and Marshall (Hon. Secretary).

Experimental Work.—Mr. Kluske reported on results of experiments with manures supplied by the Department of Agriculture, and an interesting discussion ensued. The results were considered fairly satisfactory considering the dryness of the season. The Hon. Secretary reported that the land granted to the branch for experiments in the cultivation of saltbush, bluebush, and other drought-resisting fodders was now available; necessary funds for this work were contributed by the members. Mr. J. Pfitzner reported having reaped 55 bags of oats from 12 acres of land, while adjoining land treated in the same way only yielded about 3 bushels of wheat per acre. Champion Oats gave a return of 6 bags per acre.

Summer Fodder.—Mr. Krummel tabled sample of sorghum about 5 ft. high, grown by him without irrigation. He drilled in 5 lb. seed and 112 lb. mineral super per acre. Mr. Gosling stated that maize sown in September gave a cut of green feed before Christmas, and there was now a heavy second growth. Sorghum had also done well without irrigation.

Oats for Hay.—Members would like to know from other branches which variety of oats is considered best for a hay crop.

Standard Sample of Wheat.—Members were unanimous that wheat should be bought by sample, the heaviest wheat to be paid the highest price per bushel. Until this method is adopted they were of opinion that the average sample of South Australian wheat would deteriorate, especially in respect to the cleaning.

Mount Compass, January 10.

Present—Messrs. Jacobs (chair), Gowling, McKinlay, Cameron, Slater, Peters, Good, Herring, Sweetman, Jenken, C. S. and A. J. Hancock (Hon. Secretary), and five visitors.

Bot Fly.—Members reported that this pest had appeared in the district.

"Marling" Land.—Mr. Peters tabled field peas grown on slopes adjoining the swamps; also onions grown on swamp land with and without the application of marl. The difference in growth was very marked, the crop from the "marled" soil being superior.

Bute, January 13.

Present—Messrs. Brideson (chair), McEvoy, A. and H. Schroeder, W. H. Sharman, Cousins, Hamdorf, Barnes, Stevens, A. Sharman (Hon. Secretary), and five visitors.

Black Rust.—Discussion took place on the cause of this, the general opinion being that it was largely the result of bad cultivation and the use of inferior seed. [Black rust is due to the attack of a fungus (Urocystus oculta), but the conditions under which it will develop do not appear to be well known.—Ed.]

Wandearah, January 12.

Present—Messrs. Robertson (chair), Mundy, Davidson, W. and R. H. Roberts, E. H. and J. Eagle, Dick, Collins, and Birks (Hon. Secretary).

White Eyes in Cattle.—A member reported having cattle affected by complaint in calves known as "white eyes." A white spot first appears on the eye; this spreads until it covers the eye with a skin obscuring the sight. Another member reported horses similarly affected. [For treatment see correspondence column in this issue of Journal.—Ed.] Discussion took place on question of veterinary instruction for farmers; but no decision was arrived at pending result of enquiry by Council of Agriculture into causes of complaints in cattle.

Caltowie, January 12.

Present Messrs. Hewett (chair), C. Lehmann, Graham, McDonald, Kerr, Petatz, Jettner, McCallum, Roth, and F. Lehmann (Hon. Secretary).

Summer Feed.—Discussion on this subject took place. Mr. Kerr considered the summer too dry for the growth of green fodder. He disagreed with Mr. Molineux's contention that summer crops on the fallow would not make any difference to the store of moisture available for the cereal crop. In his opinion such crops were bound to take some of the moisture from the soil, to the detriment of the wheat crop. Members generally agreed with Mr. Kerr. Mr. Hewitt thought ensilage would be the most profitable fodder for summer.

Cattle Complaint.—Mr. Kerr reported loss of cows from complaint usually called impaction. He tried the treatment recommended by Mr. Rundle, at the Angaston Conference, but it did no good. Cattle were in good condition, and had been grazing where there were green oats over a foot in height. On opening the animals he found no signs of impaction, but the brain was clotted with blood. In his opinion disease of the brain or spine was the cause of death.

Angaston, January 17.

Present Messrs. Heggie (chair), Player, Friend, Vaughan, A. and F. Salter, Smith, Radford, and Matthews (Hon. Secretary).

Zante Currant.—Members advocated planting about 12 ft. apart each way, but the individual must exercise his own judgment. Planting 4 ft. x 4 ft. was considered a mistake. Members would like to know why it is that although the fruit on the ringbarked vines colours before the untreated vines, the fruit on the latter ripens first.

Sulphuring Apricots.—Mr. Radford advised sulphuring until the juice accumulates in the cups; for about four to five hours.

Koolunga, January 8.

Present—Messrs. Butcher (chair), Button, Shipway, Sandow, Allen, Jose, Pengilly, Butterfield, Lawry, Palmer, Noack (Hon. Secretary), and one visitor.

Dairy Cows.—Discussion on this subject continued. The larger breeds were considered most suitable for this district. Members thought that the quantity of butter from any cow could not be increased except by increasing the quantity of milk.

Wheat Experiments.—Mr. Pengilly tabled samples of Ranjit, Marshall's No. 3, and Silver King Wheats, and reported favourably of each. Mr. Button showed 14 varieties grown for experimental purposes. Early Show yielded best, Boomerang and Early Waddy next.

Finniss, January 12.

Present—Messrs. Chibnall (chair), Langrehr, Heath, T. and S. Collett (Hon. Secretary).

Sanitary Pigsties and Cowyards.—At previous meeting Mr. J. Chibnall read a paper on this subject. Dairymen feeding pigs on skim milk know what a difficult matter it is to keep the styes clean and free from smell, unless a large quantity of straw for bedding is available. With paved styes the liquid usually drains away outside, causing a continuous smell about the stye and a waste of good manure. If a catchpit is made this must be emptied regularly, a most disagreeable task. Besides it is very difficult to keep paved styes in a sanitary condition, as the liquid manure will soak through any crack that may exist, and the soil underneath will become exceedingly offensive. To avoid these drawbacks he would suggest the adoption of movable styes. For six or seven pigs the stye should be about 12 ft. long, 6 ft. wide, and 3½ ft. high. Make them of hard wood, or preferably of bar iron; five bars 9 in. apart will make the sides 3 ft. 6 in. high. Fix galvanized iron to the sides, cover in enough with iron roof to give shelter, and at the opposite end fix the trough. This is best made of galvanized iron, with a length of bar iron at each side projecting far enough at each end to be bent over, so that it can quickly be hooked on to the iron bars making the sides of the stye. On the long sides of the stye a joint will have to be fixed, so that when you want to load the pigs into the dray all that will be necessary will be to remove the trough end, draw the sides together, put in the race, and drive the pigs out. To keep the stye firm the four corners would need to be clamped together. A stye like this could be moved to any part of the run; a week in one spot would be long enough. In a year three styes moved once a week would give an acre of land a good dressing of manure. The pigs would not have to be ringed, the styes would be clean, and the pigs would be healthier and fatten quicker. The same principle might be adopted with cowyards. Permanent yards are a lasting menace to health, a waste of valuable manure, and require a lot of labour to keep clean. A shed and movable yard of two square chains in area shifted once a week would in the year result in the manuring of about 10 acres of land, which would grow vegetables and green crops to perfection. Considerable discussion ensued, members being impressed with the advantages of movable styes. They thought hardwood equally as serviceable as iron.

Dairying.—Mr. S. Collett read a paper on hand separators v. factory, which evoked considerable discussion. This meeting was held at the residence of the Chairman, special interest being taken in the dairy. The Chairman stated that he had adopted the practice of testing his cows regularly with the Babcock Tester, and rearing the heifers from the best milkers. Four years ago the milk from his herd averaged 3.5 per cent. of fat; now the return was from 3.8 per cent. up to 5 per cent.

Gawler River, January 9.

Present—Messrs. H. Roediger (chair), Badcock, Spencer, Kreig, Hillier, Winckel, F. Roediger, Barritt, and Bray (Hon. Secretary).

Raising Water for Irrigation.—Mr. Winckel read a paper on this subject. In this locality ample supplies of water can be obtained by sinking, and the best means of raising the same for irrigation is a matter of considerable importance. It was necessary to raise the water as cheaply as possible. He had tried steam, horse, and wind power, and had come to the conclusion that the latter was the cheapest, though there was the drawback of experiencing calm weather when water is needed. The storage capacity should, therefore, be as large as possible. Have the well as deep as possible, and with a large diameter. A narrow well means that most of the time you are lifting the water from near the bottom. The best time for sinking is in April, as the springs then are generally at their lowest. Some people place their storage tanks at considerable height, and use a smaller distributing pipe to give pressure. He preferred a larger pipe, as less lifting was required to carry the same amount of water. The question of lifting was of importance; the power necessary to lift 40,000 gallons to a height of 60 ft. would suffice to raise nearly half as much again to only 40 ft. Care must be taken to fix the pump securely in the well; if not properly stayed, as is often the case, the pipe soon works loose, and hangs from above. The column of water in the pipe and the friction on the sides will cause the pump to sway and jump, resulting in considerable loss of power and much unnecessary wear. Air chambers should always be used in deep wells, and the pump should be put as close to the water as possible. He had frequently found faulty working of pumps due to the valves being too far from water level. The suction pipe should always be at least 2 ft. from the bottom of the well to avoid drawing in grit, &c. Rust was as bad as sand in the valves, &c., and for this reason galvanized pipes should be used. A brass pump is by far the best; if too expensive an enamelled pump will do. Keep the top of the well covered closely to prevent straw, leaves, &c., getting in, as they are likely to be sucked up by the pump, and thus prevent the valves from working properly. Mr. Badcock would plug the bottom of the pipe, and let it rest on the bottom of the well, to steady it; perforations would be made on the sides of the pipe, and these would prevent foreign substances being sucked up. Mr. Bray found buffalo leather the most enduring and best for pumps.

Cherry Gardens, January 13.

Present—Messrs. Woods (chair), Jacobs, C. and J. Lewis, Paltridge, Broadbent, Wright, Potter, and Ricks (Hon. Secretary).

Colic in Horses.—Members desire the experience of members of other branches in the treatment of this complaint.

Water Conservation. The Hon. Secretary initiated discussion on the subject, referring mainly to the neglect to utilize the vast stores of water existing at comparatively shallow depths. Mr. Potter mentioned the difficulties met with in making the tunnel for the Happy Valley Waterworks owing to the heavy floods of water met with.

Saddleworth, January 16.

Present—Messrs. Frost (chair), Benger, Daley, Eckermann, Hannaford, Leeder, Nell, Plant, Pluckhahn, Scales, Waddy, Coleman (Hon. Secretary), and visitor.

Noxious Weeds.—Several specimens were tabled. The Saffron thistle (Kentrophyllum lanatum) was more difficult to eradicate than the true star thistle (Centaurea calcitrapa), with which it was often confounded. The latter does not grow to any extent on cultivated land, being found mainly on the roadsides and reserves. The Bathurst Burr is present in the district, but is easily destroyed. The late-flowering cockspur is spreading, and is growing thickly and vigorously in the stubbles, and in some cases on the fallows. It is regarded as a worse weed than some of those that have been proclaimed as noxious weeds.

Emerald Winter Rye.—This was grown by the Chairman and by Mr. Scales. It reached 4 ft. to 5 ft. in height, and yielded up to 14 bushels 10 lb. per acre.

Wheat Experiments.—A number of exhibits of wheat were tabled by different members, the Chairman showing 40 varieties. Amongst the best were Field Marshal, yielding equal to 30 bushels per acre; Australian Talavera, 30 bushels; Bobs, 27 bushels; Steinlee, 26 bushels; White Lammas, 24 bushels; Phillis Early, 23 bushels; Tardents Blue, 21 bushels; Jonathan, 21 bushels. The Hon. Secretary promised to report later on his experiments. A Russian wheat, "Ulta," stated to be highly valued for milling purposes, produced a very dark and rather small narrow grain; it is a bearded wheat, and yielded equal to 8 bushels 7 lb. per acre.

Strathalbyn, January 19.

Present—Messrs. M. Rankine (chair), W. M. Rankine, Gooch, Butler, Mules, McAnaney, Michelmore, Watts, and Cheriton (Hon. Secretary).

Conference.—It was decided to hold the Tenth Annual Conference of Southern Branches at Strathalbyn on March 26. Owing to the apathy shown in previous Conferences by neighbouring Branches, it was suggested that in future the department should nominate centres where Bureau Conferences should be held, with a view to securing larger attendances.

Ringing the Currant.—The Chairman stated that he had tried the effect of removing a ring of bark from the stem of his currant vines, with the result that they were bearing a splendid crop.

Fertilisers.—The Chairman reported on experiments with fertilisers on a patch of land which he had been cropping for a number of years, each crop being poorer than its predecessor, although he had been using various fertilisers. From 6 lb. up to 24 lb. of muriate of potash to each 100 lb. of bone super had been used, and the dressings varied from 70 lb. to 200 lb. per acre, but with no result. Thomas phosphate had also been tried, and no result obtained. Nitrate of soda, applied at the rate of 100 lb. per acre, had been tried on seven different plots, but, with one exception, where there was a good clay subsoil, no advantage was gained. Some of the poorest land was analysed at the School of Mines, with the following results:—Nitrogen, 0.07 per cent.; phosphoric acid, 0.047 per cent.; potash, 0.352; and lime, 1.02. He intended to experiment with lime and nitrogen during the coming season, and if they got early rains would plough in green stuff to increase the supply of organic matter.

Gladstone, January 17.

Present—Messrs. Sargent (chair), Wornum, Rundle, Brayley, Smallacombe, and Goode (Hon. Secretary).

Wheat Experiments.—The Hon. Secretary tabled samples of following wheats:—Gallant, yielding 15½ bushels per acre, weighing 64 lb. per bushel; Silver King, 11½ bushels, 65 lb. per bushel; Rerraf, 10 bushels, 66½ lb. per bushel.

Manure Tests.—Mr. Rundle applied 150 lb. per acre of super to portion of his crop, and got a return of 18 bushels per acre, compared with only 6 bushels per acre where 70 lb. of super only were applied. On a headland the crop received 300 lb. per acre, but yielded no better than the portion receiving 150 lb. The general experience in this district in this, the driest season on record, has been that the heavier dressings of super enabled the plants to stand the dry spells better than those receiving only light dressings.

Boothby, January 13.

Present—Messrs. Whyte (chair), Foulds, Carr, Bradley, Henderson, Leonard, Sims, and Turnbull (Hon. Secretary).

Wheat Experiments.—The Hon. Secretary reported on results of experiments with rust-resistant wheats supplied by the Department of Agriculture, and tabled samples of each. Members were pleased with the appearance of the samples, preference being given to Smart's Early, which yielded over 14 bushels per acre. Baker's Early, Gluyas Early, and Marshall's No. 3 came next in favour.

Rabbit Destruction.—Mr. Foulds recommended the distribution of sandalwood sticks coated with a paste of flour and sugar with strychnine.

Losses of Sheep.—The Chairman called attention to the heavy losses of sheep revealed by the statistics concerning the County of Jervois. From 36,000 sheep ten years ago the number had dwindled to 6,000. This was mainly due to dingoes and rabbits, but he was confident that in the future the country would carry more sheep than ever it did. Thousands of acres of what was formerly a dense scrub had been cleared, and were capable of growing good grass if protected from the rabbits.

VENTILATION OF FACTORIES AND WORKROOMS.

CONTRIBUTED BY THE CHIEF INSPECTOR OF FACTORIES.

The following extracts on the ventilation of factories and workrooms are taken from the first report of the departmental committee appointed to enquire into the ventilation of factories and workshops in England, and recently presented to both Houses of Parliament by command of His Majesty.

RECOMMENDATIONS.

After very careful consideration we desire to make the following recommendations:—

1. That in exercise of the powers conferred on the Secretary of State, by section 7 of the Factory Act of 1901, such a standard of ventilation should be prescribed for all classes of factories and workshops not otherwise specially dealt with, that the proportion of carbonic acid in the air at about the breathing level, and away from the immediate influence of any special source of contamination, such as a person or light, shall not (except on very foggy days, when no tests should be made, on account of the vitiated state of the outside air) rise during daylight, or after dark, when only electric light is used, beyond 12 volumes of carbonic acid per 10,000 of air, and that when gas or oil is used for lighting the proportion shall not exceed 20 volumes after dark, or before the first hour after daylight; the only exception to this rule to be in cases where the extra carbonic acid is produced in other ways than by respiration or combustion, as in breweries, &c.

That Inspectors of Factories should inform the employers of the results of any official analyses of the air in their factories or workshops, should give notice that the ventilation is deficient to any employer in whose factory or workshop the above proportions have been found to be exceeded, and at the same time supply, so far as practicable, information as to the nature of any defect noticed; and that legal proceedings should not be taken against an employer unless, after a reasonable interval following such notice, the stated proportion is found, on an average of two or more samples taken in different parts of the room, to be again exceeded by one volume or more, and he is unable to show that he has taken measures reasonably calculated to secure the requisite ventilation.

That arrangements be made by the Factory Department of the Home Office for the analysis by a specially qualified person or persons of samples of air collected by inspectors (see Appendix III.), and that any analysis on which a prosecution immediately depends shall have been performed by such qualified person or persons.

That arrangements be made for Inspectors of Factories to have the use, when desired, of a properly tested portable apparatus for estimating on the spot the proportion of carbonic acid in air.

In Appendix II. we have endeavoured to give a general account of the conditions on which efficient ventilation depends. We trust that this information may prove of service both to the Factory Department and to employers.

APPENDIX II.

GENERAL ACCOUNT OF THE CONDITIONS OF EFFICIENT VENTILATION.

The present appendix contains an account of the conditions which render general ventilation necessary in factories and workshops, and of the means by which general ventilation is brought about.

COMPOSITION OF ATMOSPHERIC AIR IN THE COUNTRY AND IN TOWNS.

Pure atmospheric air free from aqueous vapour has the following composition by volume:—

Oxygen	20.94
Nitrogen	78.09
Argon	0.94
Carbonic Acid	0.03
Helium, Krypton, Neon, Xenon, and Hydrogen	Traces
	100.00

So far as known this composition is not sensibly departed from at any part of the earth's surface, apart from the purely local influence of combustion, &c.

In connection with questions of ventilation a special interest attaches to the exact proportion of carbonic acid (CO_2) in pure air. The older determinations by Pettenkofer's method gave results which varied considerably, according to the particular manipulations employed by different observers, and were usually too high by about 0.5 volumes per 10,000 of air, though occasionally also a good deal too low. Recent determinations by more exact methods show that, apart from the influence of vegetation, &c., pure air when dry contains almost exactly 3.0 volumes per 10,000. In summer weather the proportion may rise to about 3.5 volumes by night, or fall to 2.6 volumes by day, in the lower strata of the air, in consequence of the influence of vegetation.

(To be continued in next issue.)

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of persons registered and found employment by Government Departments and Private Employers from December 26, 1902, to January 30, 1903.

Trade or Calling.	Number Registered. Town.	Number Registered. Country.	Number Employed.
Laborers and youths	156	171	283
Carpenters	8	—	14
Masons and bricklayers	7	—	6
Plasterers	1	—	1
Tile layers	—	—	2
Painters	6	1	20
Plumbers and ironworkers	4	—	3
Boilermakers and assistants	3	—	—
Blacksmiths and strikers	4	—	—
Fitters and turners	5	—	4
Engine drivers and firemen	7	3	—
Furnacemen	1	—	—
Moulders	5	1	6
Patternmakers	—	—	1
Brassfinishers	2	—	2
Fettlers	—	—	1
Tool sharpener	—	—	1
Well sinker	—	—	1
Cook	—	—	1
Jointers	—	—	4
Gardeners	—	—	1
Compositors	5	—	—
Apprentices	14	—	3
Cleaners	6	3	—
Porters and junior porters	11	8	4
Rivet boys	9	—	—
Totals	254	187	358

January 30, 1903. A. Richardson, Bureau Clerk.

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No. 8. MARCH 1, 1903. VOL. VI.

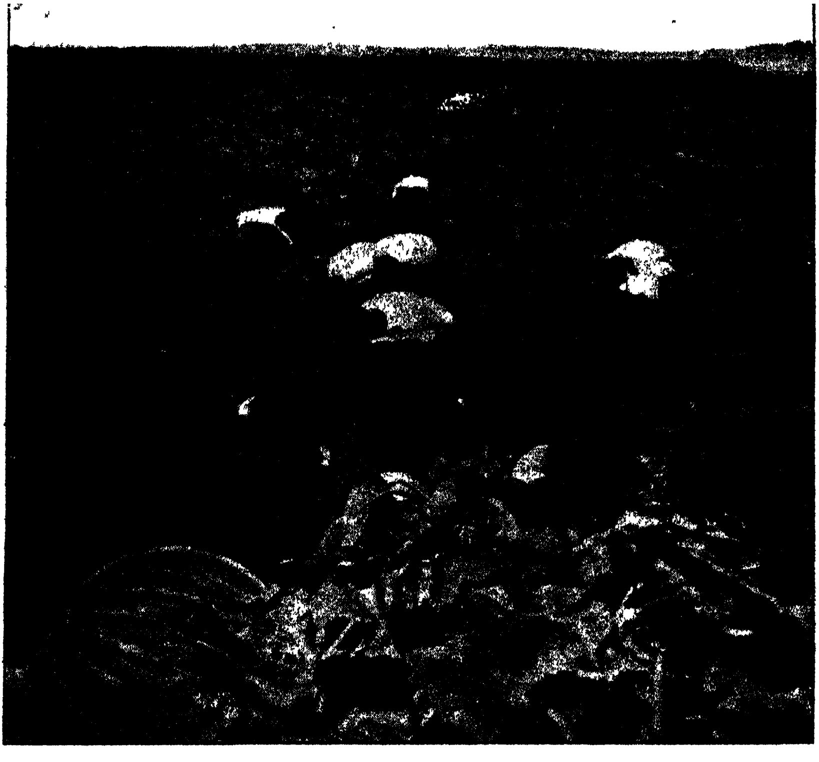
IRRIGATION ON THE MURRAY: UTILISATION OF THE SWAMP LANDS.

BY ARTHUR J. PERKINS, SECRETARY FOR AGRICULTURE.

The Murray, that is probably destined to play no mean part in the future of Australia, at present runs away in almost pure waste to the ocean. Individual exponents of the value of irrigation have certainly not been wanting in the past. Unfortunately their isolated and spasmodic efforts have failed to bring home to the general public the paramount economic value of this agricultural practice to a State such as our own. In the closing lines of his preface to "Chimie Agricole" (second edition, 1902), P. P. Deherain, who, after a distinguished career, died last December, expresses himself in the following terms:—"The great enterprise that will contribute most to the glory of the twentieth century and ensure the continuance of agricultural prosperity, will consist in rendering possible the irrigation of the soil of France, for water is the first factor in fertility." If, in reference to a comparatively well-watered country such as France, these are the last words of a man of commanding ability and vast practical experience, what would he not have said had his lot been cast beneath our hot, dry skies. Our natural facilities for irrigation are comparatively limited; and it is a duty that we owe to ourselves and our successors that not one of them should be allowed to lie idle. In all parts of the world rivers have generally been valued as the highways of commerce, and the means of intercourse betwixt the shore and distant inland communities. It were folly to overlook the great advantages of cheap freight thus provided by nature; and well-regulated irrigation need not necessarily interfere with the navigability of the stream. The recently expressed opinion that the unwritten law of nations that regulates the flow of watercourses should be abrogated in favour of the States that control the sources of the Murray can receive no support from irrigationists in this State. Not a drop of water that is ours by law can we surrender, as much in the interests of future irrigation as in the interests of the navigability of the stream.

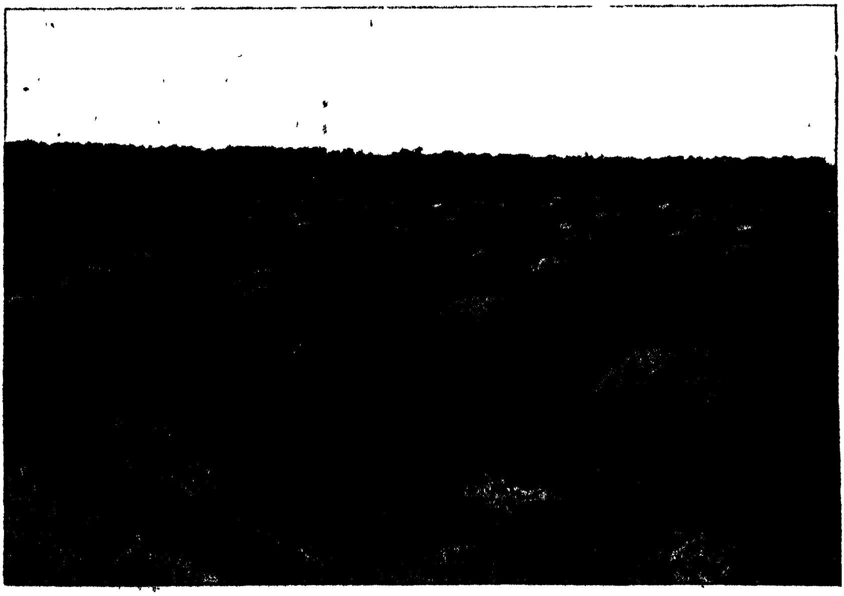
It has often been referred to as a national misfortune that the Murray, in its lower course at all events, does not traverse a more naturally fertile tract of country. Perhaps in times to come, when art has supplied its banks with the verdure that nature has denied our descendants may see cause to reverse a somewhat hasty inference. Even at the present day there lack not examples to show that, after all, this barrenness of the land, through which the river has torn its course, is only relative; let us remember with Deherain that water is the first factor in soil fertility. And next to water comes heat, with which the Murray country is abundantly supplied. Arrest the stream and furnish by artificial means the moisture that is lacking, and there is little that that cloudless sky and potent sun will not draw from a soil, the fertility of which has laid dormant for centuries. Those familiar with the marvellous growth that is characteristic of the pioneer irrigation colonies, Mildura and Renmark, know that the banks of the Murray are not dead, but asleep, and that it wants but the enterprise of man to awaken them to exuberant life. These colonies have in the past been faced by many difficulties; and it is not unlikely that the spectacle of their struggle for life through economic conditions of exceptionally severe character did not a little towards quenching the zeal for irrigation so apparent some 10 or 15 years ago. There is every reason to believe that these troublous times are now things of the past, and the new spectacle of quiet prosperity may perhaps serve to kindle afresh an almost forgotten enthusiasm.

If an abundant supply of water is one of the first essentials of successful irrigation, not behind it in importance is the price at which it can be supplied to the producer. The creation of large irrigation colonies cannot as a rule be advantageously left to individual effort. Under its regime cheap water is generally unobtainable. The State, on the other hand, benefits both directly and indirectly by the intense culture which irrigation calls into existence; and the State alone can, therefore, provide water at cost price, or even at a nominal loss, to bring about that prosperity, the beneficial effects of which are ultimately felt by the community at large. Unquestionably the costliness of the water supply was one of the lions that the colonies on the Upper Murray found barring the way to success. Wherever water has to be raised to a considerable height, its profitable utilization, even when supplied at cost price, becomes very problematic. As the river approaches its final destination it broadens and expands, eating its way right and left into the vast extent of level land that receives it, until it is lost in Lake Alexandrina. The Murray is subject to periodic floods, which generally synchronise with the melting of the snows in the regions of its sources. Towards its mouth, over the country extending from Mannum to Wellington, and higher up also, in times of flood the river steps out of its natural channel and covers broad stretches of country, that



Crop of Pumpkins growing on newly-broken-up land.

Showing belt of Sunflowers about 7 ft. high grown to protect the Tomatoes and Melons from damage by strong winds. Messrs. Morphett's residence is seen in the background.



Onion Field, with River Embankment in the background. The yield averaged about 15 tons per acre; the low yield, compared with last season's crop of 30 tons, is mainly due to the young plants having suffered severely from the attacks of thrip.

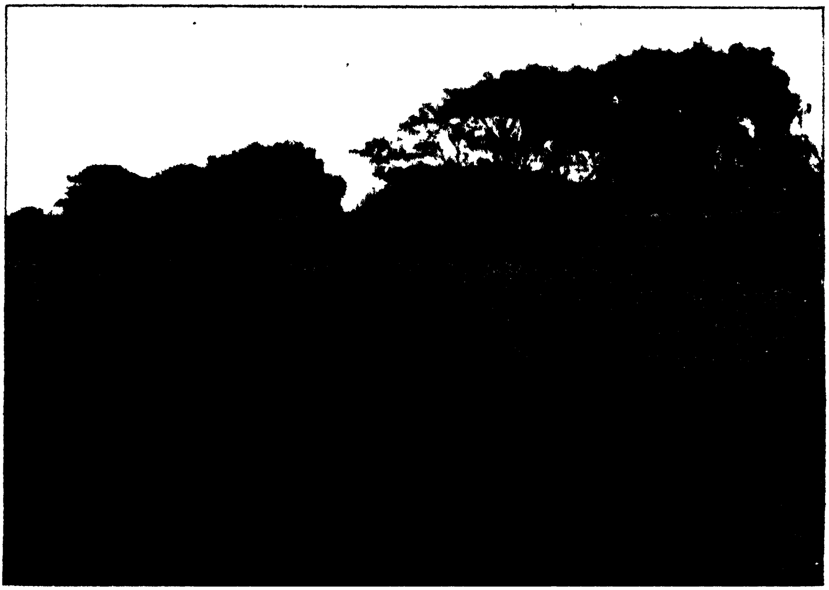
from their general appearance and the vegetation they carry, have received the name of "swamp lands." I have not been able to secure definite figures as to the area of these swamps; on the lower river they are variously estimated from 10,000 to 20,000 acres, and it is to their value that I wish particularly to draw attention in the present article, for they certainly solve the difficulty of an abundant and cheap supply of water for irrigation purposes, and their profitable utilization is therefore within reach of those in possession of moderate means. By means of mounds 3 or 4 ft. in height these swamps have been partly reclaimed on various points of the river for grazing purposes; and the rank natural vegetation that has resulted has generally amply repaid the cost of this partial reclamation. It has, however, been left to Messrs. H. W. Morphett & Co., of Wood's Point, to demonstrate definitely what marvellous results may be realized from an intelligent cultivation of these swamps. A recent visit to Murray Bridge enabled me to judge of the importance of the work carried out by these gentlemen, and, whilst they naturally deprecate any hasty generalization from the results of two or three seasons, I have their permission to quote freely from information they were good enough to supply.

Messrs. H. W. Morphett & Co. have reclaimed about 650 acres of swamp land, of which 200 acres are at present under cultivation. The work of reclamation, though comparatively simple, must have proved no light undertaking. It was necessary to so protect the reclaimed land that the river could pass harmlessly by even in times of highest flood. The 1870 flood is generally taken as the maximum level to which water is likely to rise, and in the neighbourhood of Murray Bridge an embankment 7 ft. high will check the encroachments of a flood equal in volume to the one in question. Messrs. Morphett & Co. have, therefore, surrounded their land with an embankment 7 ft. in height, and with a base 27 to 30 ft. in breadth, tapering upwards at the angle of natural fall of the soil. The soil used for the purpose was quarried out of a neighbouring cliff, and conveyed in position by a miniature tramway. This soil, however, proved somewhat porous, and let in more water than was altogether desirable. This difficulty was overcome by covering over the river face with swamp silt. I was at first at a loss to understand how a soil which when irrigated appeared so naturally porous and fine could effectively render the mound impermeable. As will be seen later on the physical analysis of the soil gives a very simple explanation of the difficulty.

Parallel to the mound runs a channel, which receives the river waters from an iron gate, which can be raised at will. This head channel distributes the water to a series of minor channels, which run at right angles to it, and which consist mostly of simple furrows from which the water filters away right and left. Nature has so arranged matters as to render these swamps almost perfect in their simplicity from the irrigationist's point of view. From the river towards the cliffs or higher lands there is a gradual fall of 2 ft. 6 in. to 3 ft., so that the surplus water drains naturally towards the back of the swamp. In addition the soil, after exposure to air, becomes of so porous a nature that the water appears to wash through it, and Messrs. Morphett & Co. have found that it is not necessary to place the direct supply furrows closer than half a chain apart. In such circumstances it must be recognised that the expenses of irrigation are reduced to a minimum, and the extreme simplicity of the system must commend itself to all.

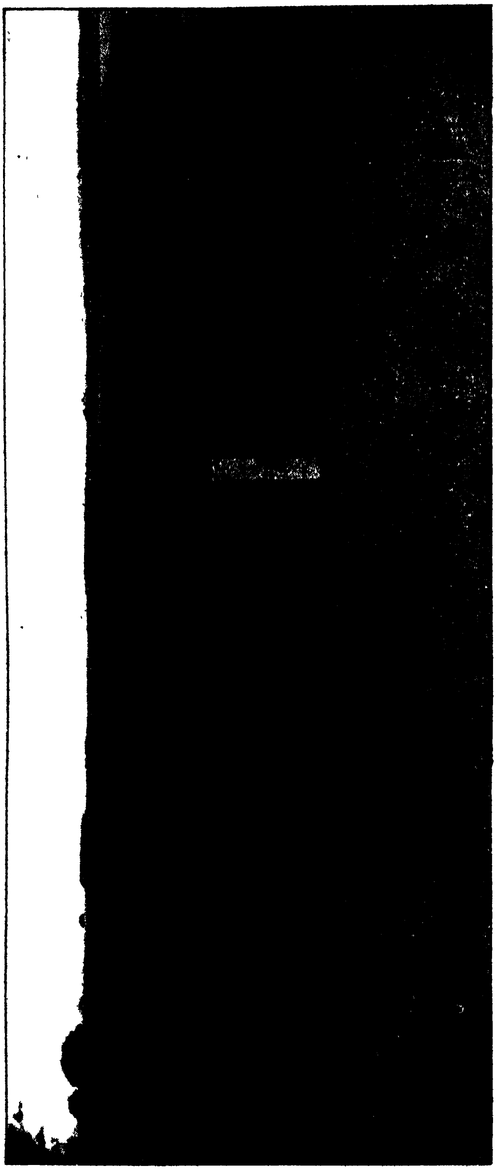
The cost of constructing such an embankment must, of course, be taken into consideration. The owners, who were their own engineers, inform me that they estimated the cost at about £10 an acre; and, further, that with the experience of the past at their disposal, an equally effective embankment might be raised at a lesser cost. When we consider the sums sunk in capital account for other agricultural enterprises this £10 per acre cannot be looked upon as excessive. The cost, for instance, of trellising an acre of currants, would in most circumstances exceed it. In fact, Messrs. Morphett, I believe, go so far as to state that reclaiming the swamps would prove a profitable undertaking even had they to build over again the embankment every five years.

On the opposite side of the river I had the opportunity of examining the swamp land in its natural state. Messrs. Morphett have expressed the intention of ultimately reclaiming it for cultivation purposes. To my mind the experiment would not be without risk. At present in times of flood the river can extend freely on one side of its banks, but were it forced to run between two parallel embankments it is to be feared that serious damage to one of them at least must necessarily arise. In the course of time, if schemes are adopted whereby flood waters are regulated in the upper river, this difficulty would, of course, disappear. The general appearance of the unreclaimed swamp is certainly not inviting; it is an entangled jungle of rushes, reeds, and other water-loving plants. In Messrs. Morphett's experience, as soon as free access of water is withdrawn these semi-aquatic plants begin to die off, and are subsequently easily cleared off the land. The swamps will then carry a natural growth of coarse, succulent herbage, which is fed down by sheep, with a view of levelling and consolidating the ground. The following season the soil is broken up with three-furrow ploughs, and worked down with cultivators and harrows. This soil, which is originally inclined to cake and rise in large clods, gradually mellows down under the influence of atmospheric agents into an admirable tilth.



This shows the Embankment and the Willows growing on the River Frontage. These are planted there to protect the bank from injury by floods. In the foreground is the Lucerne Crop shown in the next plate.

Time alone, of course, can show what crops these swamps can be made most profitably to carry. In two years of cultivation Messrs. Morphett have done much towards elucidating this question. In 1902 they averaged 30 tons of onions per acre, clearing £72 net profit. During the present season they have 20 acres under onions. From malting barley, which, owing to its liability to go down, they find themselves obliged to sow as late as in September, they averaged 40 bushels to the acre, and during the present season they have not less than 120 acres under this cereal. Eight acres of lucerne yielded the first year 6 cuts, averaging each 1¼ tons of dried hay. It is their intention to extend the area to 50 acres during the coming season. Potatoes, piemelons, mangolds, pumpkins, maize, sorghum, have all yielded magnificent crops—some of which are represented in our illustrations. Wheat, owing to its great liability to rust, has been discarded as not suitable to local conditions. I have quoted these results with the full permission of the owners, who recognise that they are as yet in the experimental stage. It is their intention ultimately to rely mainly on dairying and pig farming; and it appears to me that to both purposes the swamps, with their neighbourhood of high dry land, are admirably adapted.



Photograph of Lucerne Field, showing second season's growth. The Lucerne was put in during the Spring of 1901, and during the first season six cuts were secured, each averaging 1½ tons of dry hay per acre, or a total of 9 tons of hay per acre. The Lucerne, as shown in the photograph, is 20 ins. to 24 ins. in height; this represents 22 days' growth from cutting.

In a future article I purpose dealing with questions arising out of the chemical composition of the soil, and with various other difficulties with which Messrs. Morphett & Co. have had to contend. I may state here, in conclusion, that chemical analysis proves the swamp soil to be the richest I have hitherto come across in this State, and probably one of the richest in the world's records of analytical data.

(To be continued.)

SPEKBOOM

The presence of Australian soldiers in the late war in South Africa resulted in considerable attention being directed throughout this and the adjoining States to the fodder bush of the Karoo, generally called Spekboom. This plant is widely distributed in South Africa, and is greatly valued as food for stock. On the dry Karoo it grows abundantly, particularly on the rough rises and hills. It is exceptionally hardy, succulent, and appetizing to stock that are used to it. The thick stems and small fleshy leaves retain their moisture for a long time under adverse circumstances. The plant grows to a height of 10 ft. to 12 ft., and makes quite a large bush; it strikes freely from cuttings, and is said to transplant readily.

In view of its known value in South Africa, the Department obtained from the Cape Department of Agriculture a box of 100 rooted cuttings. These on arrival were placed in charge of Dr. Holtze (Director of the Adelaide Botanic Garden), who has also struck a large number of cuttings from a bush he has growing in the garden. It is proposed to supply several hundred plants to the Eudunda Bureau for trial, on the block of land secured by the Bureau for testing various saltbushes and other drought-resisting fodder plants. In order to give an extended trial to the Spekboom we have arranged with Dr. Holtze to supply a few rooted plants to any member of the Agricultural Bureau who will undertake to plant them where they can be protected from stock until established.

Applications should be addressed to "The Director, Botanic Garden, Adelaide," and must be accompanied with stamps to the value of 6d. to cover cost of postage.

GROWING SCARCITY OF CONIFEROUS TIMBER.

By Walter Gill, F L.S., F.R.H.S., Conservator of Forests.

Several years ago attention was drawn in the pages of this Journal by the writer to many important facts which clearly demonstrated the great danger of a timber famine in the comparatively near future if necessary action was not taken to avoid it. In the interim matters have not improved. Facts then advanced have received further corroboration, and influences then at work in facilitating the impending calamity have largely increased their power for evil; while only here and there has any effort been made in the least degree to recognise the true state of the position and provide remedial measures.

When the question of timber scarcity occurs, it is generally met with statements of the enormous amount of timber to be obtained from, say, for example, Western Australia, or New South Wales, or Queensland, America, Russia, Norway and Sweden, or Siberia. Now, it is as well in estimating the value of such statements, to remember that in a majority of cases when people are travelling for pleasure and information they are usually prepared to be favourably receptive towards such information as may be gained either by their own observation or from the communications of others; their mental atmosphere is largely permeated by the superlative degree; and often insensibly, and, no doubt, quite unintentionally, they draw largely on their imagination when retailing their experiences for the benefit of others, particularly when they desire to become at all impressive. And peculiar as it may appear, those knowing least how practically to estimate areas and quantities of timber are boldest in advancing exaggerated statements as to the inexhaustible nature of forests in parts where their travels have extended.

If a person qualified by special knowledge and experience should modestly attempt to maintain that what may seem an inexhaustible supply of timber is really totally inadequate to the unceasing and constantly increasing demand for timber, he will in all probability be met with the "I've-been-there-and-of-course-I-know" argument that some folks delight to employ as a means of triumphantly annihilating their opponents. It may easily be overlooked, however, that, as has been truly said, "We see only what we bring with us eyes to see." Any man can, of course, see trees as they are generally understood as component parts of a landscape in their various relationships to other things; but only the timber expert, with the trained eyes specially competent to judge as to their soundness, fitness of shape, and probable volume, and other important points, is at all in a position to pronounce any opinion worth having as to the probable duration of the forest supplies in any given country.

It is to men of this stamp we must refer for reliable details, and their utterances on the matter are given in no uncertain way, as with increasing earnestness they point out how steadily and inevitably the demands for timber throughout the civilized world are increasing, and ever bringing nearer the time when the supply will be completely exhausted, unless the present reckless indifference to the necessity for universally adopting an energetic forest policy, be replaced by prompt, intelligent, and vigorous action equal to the emergency. Dr. Schlich, C.I.E., F.R.S., whose masterly "Manual of Forestry" is sufficient of itself to create for him an abiding reputation, read a valuable paper before the Society of Arts, London, on February 27, 1901, entitled "The Outlook of the World's Timber Supply," in which he gave a mass of interesting details, from which the following may be selected as being of considerable importance:—

THE ANNUAL CONSUMPTION OF TIMBER IN THE FOUR PRINCIPAL IMPORTING COUNTRIES OF EUROPE.

Countries.	Home production of timber in tons.	Net imports in tons.	Total consumption in tons.	No. of cubic feet consumed per head of population.
Great Britain and Ireland	2,000,000	9,290,000	11,290,000	14
Germany	15,000,000	4,600,000	19,600,000	18
Belgium	600,000	1,020,000	1.620,000	12
France	4,200,000	1,230,000	5,430,000	7
Total	21,800,000	16,140,000	37,940,000	13

Commenting on the above figures, Dr. Schlich says:—"Considering that the consumption of timber in Britain has during the last 20 years increased at more than twice the rate of increase in population, and that a similar process is going on in Germany and Belgium, I do not doubt for a moment that the consumption in the above four countries will in a few years have risen to 20 cubic feet per head of population."

He then analyses the European sources of supply with the following results:—

QUANTITIES OF TIMBER SUPPLIED BY VARIOUS EUROPEAN COUNTRIES.

Countries.	Tons.	Value.
Roumania	60,000	Not given
Norway	1,040,000	£1,870,000
Austria-Hungary, including Bosnia and Herzegovina	3,670,000	10,800,000
Sweden	4.460,000	7,930,000
Russia	5,900,000	8,900,000
Total	15,130,000	£29,500,000

It will be noted that, of the total consumption of 37,940,000 tons used annually, the four countries concerned produce 21,800,000 tons themselves, leaving 16,140,000 to be supplied from other sources by importation. Of this, however, the European countries now indicated as being in a position to export timber only supply 15,130,000 tons.

The question at once arises as to how far existing supplies are capable of expansion to meet the increase in present requirements foretold by Dr Schlich, and respecting this he points out that any increase in Roumania will be so small as to be a negligible quantity, while all authorities are agreed that the Norwegian forests, as a whole, have been considerably overworked, and that a decided falling-off in the export must set in almost immediately. Turning to Austria-Hungary, Bosnia, and Herzegovina, he notes that, while the two latter countries yet have considerable surplus stocks, the Hungarian forests have been considerably overworked. "Even as regards the State forests there, the Director-General of the forests has publicly stated that the standing crop of timber is some 30 per cent. below the amount which should be present to permit of a permanent supply like that lately taken out of the forests. Again, of the forests in Austria proper, more than half the area is situated above an elevation of 3,000 ft., so that their annual growth is small. Even now an agitation is going on in Austria for an export duty on raw timber, so as to check it. More than half the timber exported goes to Germany, and the opinion has been expressed that that country will soon have to look elsewhere for sources of supply to meet the increasing demand for timber in its industries. In short, Austria-Hungary is not likely to remain an exporting country for more than a limited number of years. This means that Germany must more and more compete with Britain in the Baltic trade, thus not only reducing the supplies available for Britain and other countries, but also considerably raising prices." Referring to Sweden, the doctor states: —"It is probable that the present outturn may be maintained and even somewhat increased, but by no means to such an extent as to make up for the prospective falling off in the exports from Norway and Austria-Hungary." Regarding Russian forests, he points out that of the 314,000,000 acres State, and 202,000,000 acres of private forests in Russia and Finland, enormous areas consist simply of swampy tracts, producing little or no timber, and very extensive areas are only thinly stocked with alder, birch, poplar, hornbeam, &c., so that the really important forests form only a fraction of the total, imposing as it may seem. "Definite information regarding the yield capacity of these is," he says, "difficult to get at; but there can be no doubt about a few points. The population of European Russia, including Finland, is now estimated at 106,000,000, and it has of late been increasing very rapidly. The consumption of timber and firewood in a northern country like Russia is naturally very great; indeed, in many parts of the empire it has been estimated at three tons per head of the population. If this is so, by far the greater part of the forests is required for home consumption." He then refers to remarks made by Monsieur Melard, Inspector of Forests at Paris, under the French Republic, who says:—"When in the middle of the twentieth century Russia will have a population of 150,000,000, when her metallurgical and other industries have attained the full development on which one may count, her exports of timber will have ceased, and she will be only too happy if she then has managed her forests sufficiently well to find in them the timber and firewood which she requires for her own consumption."

(To be continued.)

"IMPACTION" AND DETERIORATION OF PASTURES.

The continued losses of cattle throughout the country from local ailments makes of interest that which throws some light on the subject or which tends to solve part of the reasons why our farmers are suffering such serious drawbacks to the successful carrying on of their business. Mr. H. Pye, of Dookie Agricultural College, has published in the Victorian Journal of Agriculture notes on the pastures and fodders of the northern areas of Victoria from which the following notes, referring more particularly to the necessity for improving our pastures, are worthy of careful thought by our farmers.

"The feeding value of our pastures is a problem that interests us vitally. Pasture grasses vary considerably. The dependence of animals on plants is either direct or indirect. In respect to farm animals it is almost wholly direct, and, in the case of pigs and poultry, to a minor degree indirect, since animal food is conducive to their wellbeing. Plants, as is generally known, obtain their food from the soil, water, and atmospheric air, and, by the action of sunlight, these substances are elaborated into starch, sugar, fat or oil, tannin, albuminoids, &c. When animals eat the plants many of these products are utilized. and are broken up to supply material to build up their bodies, thus it will be seen in the case of gramnivorous animals. If the plants do not contain sufficient of an essential product to build up a certain material or part of their bodies. disorganization must follow, or practically starvation. This may be illustrated in many ways, but it can be conclusively proved by experiment. Owing to the interdependence of the various organs on each other, if one becomes inactive it does not supply material in a form that a second one, depending on it, can formulate into nutritive matter, consequently a third organ cannot perform its functions, and finally the whole organization is disarranged, and most likely death will follow; or, as is often the case when partial starvation of a part takes place, the breeding qualities of stock are reduced and the progeny degenerates.

"By analysis it has been proved that plants, in which grasses are particularly included, vary considerably in composition. Thus it is possible that the health, development, and condition of stock of one district may be superior to that of the stock of an adjacent district. The feeding properties of our pastures mainly depend on the dominant species or variety of grass growing on them, yet, not only on this, but also on the fertility of the soil, neglecting the conditions of climate, which we shall suppose to be similar. Certain grasses under whatever condition they may be grown, are poor in food-supplying qualities; other grasses are richer, but the relative amount of this nourishing matter will most likely depend on the fertility of the soil; and, in fact, the same conditions in respect to the development of a pasture grass hold as in respect to the development of an animal. If there be too little potash, nitrogen, phosphorus, or lime in a soil for a certain plant, it loses its vigour, and is forced out of existence by another plant, perhaps a weed, that thrives under less favourable conditions in respect to the missing plant food. If the climate be a moist one, the grasses may have every appearance of excellence, yet, owing to a deficiency of phosphates for instance, the stock feeding on them, particularly young stock, will not do as well as might be expected.

"If we consider the many prunings the grasses of the fields receive every time the stock pass by, and the increased drain on the plant food within the area influenced by each plant, it will be patent to every one that there must be some limit to this exhaustion, and, when it is reached, the grasses degenerate, and are replaced by plants of less economic value, to the detriment of the stock. If matured animals alone be fattened, the deterioration of the pastures will be less rapid; but when the products of the farm and the stock reared on it are being sold every day, the exhaustion of the pastures is very marked. It is not alone the exhaustion of the plant food that deteriorates the pastures, but overstocking often prevents certain plants from being able to perform their functions, owing to an inherent objection to hard grazing. The remedies are evident in both instances. Top dressing, with suitable manures in the one case, and less stock in the other. From practical experience I can safely say that a grazing paddock top-dressed with composts or with phosphatic manures is a splendid stand-by, especially for milch cows. Pastures composed of a number of different grasses have some special advantages which are not enjoyed by pastures limited to one or two species. If we take our kangaroo grass it will be noticed that, as a gregarious plant, it is, in this district, coarse and little relished by the stock; but, when growing solitary, it affords a splendid bite for all stock, which turn to it as a change from the other grasses; for stock, like human beings, are not averse to a change, and this, no doubt, is due to a want in the system which is instinctively known, and this is one of the reasons that an animal goes from one kind of grass to another. Thus it will be seen, should we analyse our pastures, that the results expected from the analysis may not be in keeping with the facts, as demonstrated by the condition of the stock; and, again the older growths vary in composition from the younger ones, while peculiar flavours are developed, some grasses being bitter at certain stages of growth.

"There is one point which is worth considering in reference to our pastures, that is, the richer the soil is within certain limts, the longer do they keep green, other condtions being equal. An interesting experiment was carried out last season with one of the indigenous grasses, viz., wallaby grass (Dauthonia pencillata). A small plot was top-dressed with bonedust, and another plot was not manured. In the latter plot the grass dried up as soon as the hot weather had set in, or just a little after similar herbage in the paddocks, but that which was top-dressed kept green for six weeks longer. Visitors who saw this grass, and particularly farmers, were struck with the fine sward presented, and wondered what that fine grass was, expecting it to be a rare foreign introduction instead of what it really was, our own indigenous wallaby grass treated with a little more generosity than usual. Thus, I say, in respect to the northern districts, treat your indigenous grasses well and you will find that you have the safest stand-by for your stock in the time of drought, for their feeding value will be superior, and their permanency will be assured. Every grazier who is successful in the drier parts of the country keeps one or two paddocks for topping off his stock for the market, or as a stand-by for some future part of the year; but, as a rule, he confines the better treatment to the one paddock, as if it had an hereditary right, consequently it thrives apace, while the neighbouring paddocks become poverty stricken from the continuous drain on their resources. There is no greater mistake made than to neglect the rule of rotation with pastures, and no easier way to be assured of their success than by attending to it. Unfortunately, want of capital prevents many agriculturists in a new country from carrying out a proper rotation owing to the cost of subdivision fences and manures; but, as far as the means will allow, the nearer the grazier approaches to the carrying out of a system of rotation suitable for his district the more likely is success to follow. A simple rotation, where it is not possible to manure, would be to rest the pasture paddocks alternately, to allow bare patches to fill up by seeds formed, and if sheep have been running over the paddock, let the horses or cows graze over it for a season, since they will not be so severe on it. A rotation of stock on a pasture is certainly worth considering more earnestly than it appears to be. An occasional harrowing of the pastures, where possible, gives good results, as I have found from experiment."

FARM HINTS FOR MARCH.

By A. Molineux.

Theory is not science, but theory sometimes leads to the truth. My theory is that the volcanic eruptions and sunspots have developed a deal of energy in our atmosphere which must result in frequent disturbances and rain during the present year. The long drought has broken up, and we may hope for early and continued rains. We must fear the advent of red rust this year, and it will only be prudent to secure seed of the rust-resistant varieties of wheat for a good portion of our fields.

Much trouble is being experienced in many places through the drifting of sand. This can be stopped by sowing such land with rye or barley, and keeping stock off the land for all time. Windbreaks should also be planted systematically. Evening primrose, French honeysuckle, buckwheat, and many other plants will thrive on sand, not forgetting the medics and melilotus varieties. Crops grown on sand should always be removed for feeding to stock.

Pigs intended for slaughter should now be fattened up on meal, grain, peas, milk, but should not have any green stuff or slush. Do not try to make very heavy weights, nor to produce skins of grease. Ten weeks' feeding should make the animal fat enough, and 80 pounds' weight will be heavy enough. Keep the boar shut up, as it is not convenient to have young pigs on hand when the weather is too cold and unhealthy for them.

Secure the services of a really good bull. If a pure Shorthorn of a good milking family can be got it will do; but a good Jersey or Ayrshire will be preferable to a scrubber. Cows are wanted to come into full use when butter brings the highest price; therefore, the bull's services should be requisitioned during the present month.

Even if wheat were the most profitable crop to grow it would not be wise to devote attention solely to that grain; but, as a matter of fact, there are other products that pay quite as much, if not more, than wheat; whilst at the same time either resting, cleaning, or improving the soil. The whole of the fallowed land should not be sown with wheat, but some should be given up to producing food for the animals upon the farm. The poultry cannot do themselves justice without a good quantity of green feed; pigs ought to have a lot of herbage during the early part of their lives; ewes cannot rear good marketable and export lambs without milk-producing fodder; horses must have a good lot of green stuff to keep them in good health; and cows cannot give full pails of rich milk without succulent grasses or their equivalent. Now, all of those animals, if rationally looked after, will pay more per acre for what is raised for them than the best crop of wheat that can be raised at present prices. Ensiled fodder will last for years, and it is a bad farm that will not grow crops for ensilage. The best silage can only be made with a variety of plants, and it is possible to make a mixture that will grow well together and come into flower about the same time. Bokhara clover, peas, vetches, oats, barley, rape, or some similar mixture would make ideal silage, and stock would leave all other food when they could get this. But for lambs and ewes it would be worth while to sow a mixture of rape, white mustard, barley, and rye as early as possible on a few acres of well-prepared land. This will come forward rapidly if we have any early rains, and by the time this feed is done the natural herbage will have made progress.

Where night frosts are not early or over severe, it may be possible to establish some lucerne. The land should be deeply and thoroughly pulverized, made as level as possible, and broken almost to dust on the surface. Sow 12 lb. of seed per acre with a drill in lines 10 to 12 inches apart, and half an inch deep. Roll the land at once, and when the plants are three or four inches high use light harrows to loosen the surface. Sand lucerne (Medicago media) would probably do well on sandy land where common lucerne (Medicago sativa) would not thrive so well. Baron F. von Mueller strongly recommended Medicago scuttelata for arid and dry localities. It is a pity that exhaustive trials have not been made with that valuable plant.

Sorrel is a pest on some farms. In the south-east it has been found possible to eradicate it by ploughing it under deeply, then sow thickly with clover or some other smothering crop. After two years it begins to show up again, and it is then ploughed under before it seeds, when it is completely eradicated.

When the farmer carts away a load of wheat from his land he takes off about half a crown's worth of phosphates, nitrates, and other necessary articles for the production of a future crop. When he takes off a ton of butter he removes less than two and sixpence worth of those articles. The ton of butter would purchase many tons of wheat though.

One of the most successful of farmers in the dry north said it paid him exceedingly well to use a considerable lot of manure on fields adjacent to the homestead, because the grass grew well on such land, and his fowls, cows, pigs, and other animals made good use of it. The same farmer, however, was very careful to prevent fowls and pigs coming together, because it was unhealthy for the hens when the pigs grabbed them. He would never allow the fowls to roost anywhere near the stables, or to gain access to the feed boxes, because the fowl lice annoyed the horses, and the hen manure did not promote the comfort of the draught stock. Some farmers consider such trivial matters to be unworthy of attention.

Prepare a small nursery bed with plenty of old cowyard manure, well mixed with sandy loam, and sow an ounce or two of seeds of Jersey tree kail, thousand-headed cabbage, Drumhead cabbage, and an ounce or two of James's long-keeping onion or brown Spanish, for planting out in May or June. Get a small field prepared for planting with the results of the sowing.

There is an awful waste of fertilising quality in stacking manure until it decays; but the process kills seeds of undesirable weeds. Carting manure on to the land when it is sodden with wet is both laborious and injurious.

Fresh manure carted directly on to the land does not lose much by drying, but when ploughed under it decays rapidly and everything is absorbed by the soil. There are very few fields that would not be greatly benefited by ploughing under a green crop, and weedy manure scattered on the surface would therefore prove beneficial if attended to in good time. The cowcakes on some farms would do some good if they were smashed up instead of preventing the growth of grass on a large area of surface. Poisonous weeds of various kinds, and utterly worthless bushes of other plants cover probably one-tenth of the area on other farms, and no attempt is ever made to exterminate them.

A small lot of carrots, parsnips, sugar beets, and mangolds should be sown now, but a larger lot during the next two months. Carrots and parsnips do best on deep, rich, sandy loam where manure has not been recently applied. Mangolds and beets will thrive on saline soils, if not too heavily charged with salt. Carrots keep horses healthy, and parsnips are beneficial to cows in particular, and all stock in general.

Every weed on a field takes the place of a beneficial plant, and thus reduces the value of the crop. Poppies in a crop (so says Mr. F. E. H. W. Krichauff) can be killed without injury to the cereals by spraying with a solution of kainit. Charlock, in Europe, is now systematically destroyed by spraying with a solution of copperas (sulphate of iron). The hairy or woolly leaves retain the solutions, whilst the liquid slips away from the foliage of the wheat and other cereals.

ROSEWORTHY AGRICULTURAL COLLEGE NOTES.

FARM.

By J. D. Towar, Professor of Agriculture

Summer Crops.

Maize planted early in October made only a partial growth, sending out male flowers early in January. Furnished good feed for the cows while it lasted. Had the seed been planted a few weeks later the crop might have been benefited by the December rains and made a much more satisfactory growth.

Lucerne sown October 1, without irrigation, is alive, and making a good fight for life. The showers of the past two months have been of material benefit, and, unless killed by burning weather within the next few weeks, there is a fair prospect it will live permanently.

Five varieties of millet were tried, but the unfavourable weather during October permitted only partial germination, and retarded early growth, resulting in a very scanty crop. The yellow, Japanese, white, and Hungarian varieties have matured, and are now shelling seeds on the ground. The Pearl variety is a later sort, and a rank grower. It resembles sorghum, and under favourable conditions attains a height of 12 ft., and produces from 15 to 20 tons of green forage per acre. It is now making growth similar to the sorghum.

Sorghum, now from 1 to 4 ft. high, is still growing, though the check it received at first has practically ruined the prospects of a crop.

Cow peas, soybeans, sunflowers, vetches, clover, spurry, rye grass, Fescue, broom grasses, and cow grass, sown October 1, were complete failures.

Silo.

In view of the fact that silage in other climates has been stored for the past 15 years, without resorting to expensive and laborious operation of weighting, we tried one pit by covering simply with a layer of chaff four to six inches deep. The result, while not completely successful—there being about two feet more of damaged silage than in the pit, which was weighted 1 cwt.

per square foot—is sufficiently encouraging to warrant another trial. By more carefully packing the material as it is being put in, moistening the portions which become too dry, and by more completely protecting the top silage by chaff, there is a fair prospect of dispensing with the work of putting on and removing the heavy weights. Below the layer of spoiled ensilage a quality of feed equal to the best from the weighted silo was obtained. It might be noted that silage, which keeps well without compression, is cut fine before putting into the pit, and generally is kept in a colder climate.

POULTRY NOTES.

By D F. Laurie.

Egg-laying Competition.

Experiments, dating back 15 or more years, were made in America with the view of ascertaining which breed of fowls laid the greatest number of eggs during a stated term. Since that time egg-laying competitions have been frequently held in the United States of America, Canada, and England, and during the last seven or eight months in New South Wales. Some people attach considerable importance to the value of these tests, but, on the other hand, many observers, with whom I agree in the main, hold that no practical value is obtained.

In view of the proposed egg-laying competition to be held in Adelaide I have a few remarks to make:—

1. Selection of Breeds and Varieties Thereof.—The chief difficulty here is to select a group of hens and pullets of each sort, thoroughly representative of each breed and the varieties thereof commonly kept. If only a few pens, the property of one or two breeders, are entered, the competition is simply between the birds of those members who may or may not stand in the foremost rank as breeders of those sorts, or who may or may not own good laying strains. If the competition is to be with the view of finding the most productive breed of hens, then a collection of hens and pullets should be selected from all the breeders possible, so as to make the trial thoroughly representative of that breed. Now, as regards prize money, very few competitors go solely for honour and glory, and I should be inclined to think that the prize moneys should be very large, as the various owners of the birds in the winning pens would have to divide. In addition, a certificate should be issued, and also a patent marking ring for each hen in the winning pens; first, second, and third.

2. Housing.—This should be up to date in design, yet of construction within the means of people of average means, and as simple as possible. I think models of houses and yards might be exhibited and adjudicated upon.

3. Feeding.—This is the point on which a few remarks are especially due. To weigh out each meal time a hard-and-fast measure of food is a "rule-of-thumb" proceeding, which no breeder of any standing would consent to for one minute. Some breeds are starved; others overfed by this method. I should suggest the provision for all pens of green food, grit, crushed charcoal, and fresh water ad lib. As regards food, each pen should be given as much as it requires, and that quantity should be carefully weighed and noted. The food should be such as is within reach of the average producer, and as the competition is for laying, a certain amount of forcing food may be given. Green-cut bone should be regularly supplied; this is a necessity for egg-production, and the cost of a bonecutter is not excessive. The use of blood meal may also be allowed.

With this test, providing that the feeding is carried out intelligently, with frequent handling of the occupants of each pen, we shall ascertain the egg yield under favourable circumstances—the birds being fed to the best advantage. The cost of food for each pen will be duly debited, and the value of eggs credited at the average price for fresh eggs in Adelaide. Most probably leading grocers and others would pay a high price for these unfertile eggs delivered daily during the competition, but as this price would be more than the average producer would get it might not be fair to adopt it. The food would be purchased on the average quite as cheaply as the average breeder could obtain it. By this method we arrive at facts which show the cost of production per egg for the various breeds under trial.

Any method other than that by which each breed is fed to the best advantage is of no value, and is misleading, as it is well known that some breeds become too fat to lay on an amount of food on which others would starve, and yet the additional cost of food required by some breeds, notably Minorcas, is far more than counterbalanced by a heavy yield of fine eggs. The quantity of food required by various breeds is a matter of great moment to many in a small way, and is of vital importance where the operations are on an extensive scale.

Again, every reasonable aid to laying should be provided; the withholding of grit. green food, cut bone, &c., is poor policy, because it has been proved that the small cost is repaid manyfold. A great many people visit these competitions, and if an object lesson is really to be given, then it should be is accordance with modern practice. A good manager would be necessary and a small committee of practical men. Conducted on proper lines such a scheme is worthy of support.

TABLE POULTRY.

It has been stated that South Australia is more suited for egg-production than for table-bird breeding, but here I differ. The real trouble is that people will not breed the proper fowls for export purposes. Any hen will lay more or less eggs, but we must have the proper breeds, and their crosses for table-bird production. For a good many years, I have been writing for The Journal of Agriculture, and have written thousands of letters advising people in different parts of the States. Nearly all my life I have studied the poultry question, and when the trade between America and England was first started, I foresaw the day when cold storage would link Australia and England, and this is in print. Every publication procurable embodying the opinions of the best English experts, I have carefully examined, and incorporated into my articles. lectures. and letters. Therein, I have told the producers of the State what to breed to fulfil the requirements of the export trade with England. To breed and forward anything to the English market, other than what is there demanded and considered suitable, is rank folly, and will end in failure. This remark applies to all produce, and it should form the first article in the producer's creed.

After all these years I frequently see the most unprofitable and unsuitable crosses recommended at meetings of the branches of the Bureau, and on many occasions members of the Adelaide Poultry Society have recommended equally unsuitable crosses. It is so easy to state that, as every informed breeder knows, such and such breed and crosses are the only ones which bring high prices. Experiments with crosses are legion, and breeders generally are prone thereto; all these other crosses have been tried, and found wanting. There are but few really good crosses. As a rule, whatever is printed is taken for gospel by many people, and it behoves those who pose as teachers to be accurate in their statements, and not put personal fads in place of facts.

As regards the branches, I have long been in hope that they will take the poultry question in hand. It is worth it—it is one of our chief staples—as food supply and as an item of export. I should like to see comments, and exchange of opinions reported at each meeting, and discussion of schemes to revolutionise the unsatisfactory methods of disposal at present existing. There are still plenty of people who sneer at poultry as beneath their notice, and it is such people we can well spare. The poultry industry should be one of our chief sources of wealth. Our State is most suitable, and there is an unlimited market. So long as we produce eggs, and improve our methods of marketing, there will always be a profitable outlet. As regards table poultry, if we breed what London wants, a very profitable trade can be established without any risk of those sudden slumps which threaten other exports. Poultry and eggs are important articles of food, and far more of these are now consumed in proportion to population, than was the case years ago. As regards eggs, enormous quantities are used in arts and manufactures, and in this direction the demand is growing.

English Imports

The Stockkeeper says:—"The imports of eggs and poultry from abroad to England have just been issued in the trade and navigation returns, and the year 1902 will be remarkable as showing the greatest increase of any one year since these returns have been published; 1901 showed a very slight increase over the previous year, but this has been more than made up. The values of imports for the last three years are:—

	1900.	1901.	1902.
Eggs	£5,406,141	£5,495,776	£6,299,934
Poultry and Game	1,010,327	980,739	1,059,000
	£6,416,468	£6,476,515	£7,358,934

Thus the total increase of imports during 1902 over 1901, amounted to no less than £882,419. This was chiefly in connection with eggs, the increase in value of which was £804,158. The increase in poultry and game was £78,261, but this was very little above the total of the year 1900." Thus it will be seen that England's needs are increasing each year; since 1894 the sum has doubled. It is only right that Australia should add her share of exportable eggs and poultry.

General.

The addition of oil to kerosine emulsion is to be recommended; any kind of animal oil, fat, or fish oil will do. Use as hot as possible, as stated before; the oil chokes the spiracles through which the ticks breathe, and they are then suffocated.

The moulting season is now with us, and soon those hens properly attended to will be laying again. I would urge all readers to improve the quality of their flocks this year. Those who contemplate purchasing should not delay, as stocks are limited, and the high price of food will make Adelaide breeders anxious to reduce numbers, and for a time good birds will be cheap. It is poor policy to buy cheap rubbish, as a rule they are poor performers, and they never look well, and cost nearly as much as good ones. My experience is that breeders want good-looking birds, although many expect to get winners and champions for the price of a poor quality table bird. The gradual improvement of the laying of our hens will mean many thousands per year for every five eggs per hen, and there is no reason why the present average should not be doubled.

A friend who recently returned from a visit to New Zealand, tells me he was astonished at the state of the poultry industry there. Many farmers told him they made more from poultry than anything. He says hundreds are entering the business, and all are doing well. The Government there has done excellent work in teaching.

THE DANGER OF FLIES TO THE MILK SUPPLY.

By G. S Thomson, N.D.D., Dairy Instructor.

Towards the close of last summer and shortly before my departure to Europe, the attention of Mr. J. M. Morris, M.R.C.V.S., and myself was drawn to the occurrence of a bitter taste in the milk supply of a farm of 60 cows, situated close to the city. The flavour complained of was not confined to the milk of individual cows, but appeared to be general in the herd. At the outset of our enquiries we considered the health of the animals, but there was nothing apparent to justify us in attributing the flavour to bodily derangement or disease. We then tested the milk of each cow at the commencement of milking for the percentage of acid, which resulted in a marked variation in the determinations made. Continuing the examination, it was demonstrated that fluctuation in the acid readings were common in the milk of single cows. Believing those changes to have arisen from the nature of the food consumed by the herd and the individuality of the cows, we conducted a number of experiments which bore some evidence of the influence of the rations in governing acidity.

Being now suspicious that the food was responsible for the bitterness, the pastures were next examined, and a number of plants gathered for testing purposes. These were artificially digested, and sterilized milk inoculated with the juices gave a slight bitterness, but we were not disposed to accept this as the cause of the trouble.

Pursuing the investigation, we directed attention to a quantity of brewers' grains which constituted the chief daily food supply of the herd. Observations showed that myriads of flies were present on the grains, and were also numerous in the dairy, and about the cows and milking utensils during milking This led us to suspect contamination of the milk with dirt carried on the bodies of the insects, whereupon we obtained a number of tubes of culture media, and introduced flies into the tubes in the dairy. In a few days very pronounced cultivations were obtained, and microscopic examination determined that the colonies belonged to the yeast family. Inoculations of samples of sterilized milk were made, and a distinct bitterness was reproduced. Microscopic tests showed numerous yeast cells, and, it might be stated, that the cream layer was especially affected with the bitterness. That the cause of the complaint was conveyed by the flies was confirmed in the final examination of cream in dishes of milk kept in the dairy.

From this and similar investigations, farmers and others associated with milk supplies might take warning and keep their yards free of attraction for insect life by removing fermentive foods from close proximity to the dairy and milking bails, while the buildings are maintained in a clean and thoroughly sanitary condition. A detailed report on the investigation, with illustrations of cultures, was intended for publication months ago, but it was unavoidably held over.

COUNCIL OF AGRICULTURE.

The monthly meeting of the Council of Agriculture was held on Wednesday, February 25, all the members being present.

Discussion took place on the position of the Council as regards the Agricultural Bureau, and a committee, consisting of Messrs. Caldwell, Krichauff, and Molineux was appointed to wait on the Minister of Agriculture with a view to the Council being placed in the same relation to the Agricultural Bureau as was occupied by the late Central Bureau.

The Secretary stated that the Minister had decided to consider the possibility of placing a portion of Mr. D. F. Laurie's time at the disposal of the Department of Agriculture when next year's Estimates were dealt with.

The Minister intimated that he could not at present sanction the expenditure necessary to connect Roseworthy College with Gawler telephone exchange. Members decided to ask for estimate of cost. The Minister also informed the Council that with a view to the better utilization of the services of the Dairy Instructor he had decided that Mr. Thomson should take up his residence at the College. He would be required to take charge of the dairy, and also to give regular instruction to the students, besides visiting factories, &c., as required.

The Council decided to ask the Minister to arrange for a competent veterinary authority to give lectures to the students at Roseworthy College. It was also decided to ask that greater powers be given to the College authorities in respect to carrying out repairs and improvements on the College farm.

The Secretary stated that in view of the fact that in the eastern states outbreaks of anthrax had been traced to the use of Indian bonemeal, it had been decided that all bones, bonedust, or other similar matter imported into South Australia should be treated in such a manner as would ensure the destruction of any germs of anthrax. Regulations to give effect to this decision were in course of preparation.

It was decided to ask the Secretary for Agriculture to arrange with the Yorke's Peninsula branches of the Agricultural Bureau for a visit by the Chairman and Mr. Thomson.

NOTES ON VEGETABLE GROWING FOR MARCH.

By Geo. Quinn, Horticultural Instructor.

With water in moderate quantities available for irrigating, this month may be profitably employed by the vegetable grower who resides upon the plains country. Plantings will be made of Cabbage, Cauliflower, Broccoli, Brussels Sprouts, Celery, Kohlrabi, Lettuce, Onion, and Potatoes. In the case of the members of the Cabbage family sturdy young plants should be secured, with a branching root system well developed on each. If they have been brought from other gardens, or show any signs of caterpillars or aphides, it is a safe precaution to make up a couple of gallons of tobacco and soap wash, into which they may be submerged before planting out. This often nips "in the bud" what might otherwise develop into a ruinous attack, for these pests are the bane of the grower of early cabbages. In setting out the plants carry them in a flat dish—a kerosine tin split lengthwise acts well—with their roots in thin liquid mud. Allow one person to go along the line making the holes with a dibber, and pouring into each about a pint of water. The planter follows closely behind him, and quickly transfers the plants' roots from the puddle in his dish to the liquid mud in the hole, and then draws the dry soil around to support the stem. No further watering is required at the time of transplanting; but the soil—in the absence of rain—should have been wetted to a working point before planting; and after the plants are set it should be hoed over and pulverized on the surface as soon as it is no longer sticky. Just prior to giving this hoeing a light sprinkling of superphosphate and sulphate of ammonia in the proportions of two of the former to one of the latter, may be spread around the plants as a stimulant. With a healthy, strong start these plants will generally resist diseases until the regular rains set in, when, as a rule, they "cease from troubling."

Onions set out in March are usually grown for early harvesting and immediate consumption; consequently the softer and whiter sorts are favoured. It is no use to plant potatoes now if frosts are frequent in the locality during the winter season. In the absence of these, the best crops may be obtained from autumn plantings. The soil should be moist and the "eyes" started at the time of setting out. A sprinkler played over the surface for an hour or two—a day before breaking up the ground—will secure the former. The eyes may be started by spreading the tubers in a cool, damp, fairly dark place, and covering them lightly with damp soil or a moist bag. If a few rods only are to be planted it is a good plan to place the tubers or setts on end in shallow boxes, with the eyes upwards, sprinkle a little moist, warm, light soil between them, and cover them with a damp bag. As the buds or eyes start, only three or four of the strongest should be left on each sett. When planting the setts are placed carefully in the shallow trench prepared for them, and covered over gently. A good dressing of well-decayed stable manure or bonedust should be mixed into the trench before putting in the potatoes. The surface of the bed should be hoed or harrowed up finely after the planting has been completed, and again after showers or waterings. If only a limited volume of water is available, and the soil is fairly porous, water by means of overhead sprinklers. On the contrary, if the soil be tenacious apply the water in trenches until such time as by the incorporation of lime and organic matter it can be made suitable for the sprinkling method. The ideal conditions for vegetable production in this State would appear to be rich, deep, porous soils, with water to admit of overhead watering, followed by frequent stirrings of the surface of the ground.

Sowings will be made of Peas, Broad Beans, Spinach (prickly), Parsley, and Cresses. These will admit of the introduction of abundance of farmyard manure to the soil prior to being sown. Sowings should also be made of Radishes, Carrots, Parsnips, Turnips and Swedes, and Red Beets. All of these root crops are best suited in free soil, which received a rich dressing of organic manure during the preceding season. This in itself points to an easily arranged succession or rotation of crops in the vegetable garden.

The early planted Cabbages and other succulents, and the first lot of Peas to germinate, are much relished by sparrows, presumably in the absence of soft, green food in the fields. In limited areas a simple remedy is found in tying a thread of black cotton along over the top of each row, about 2 inches from the soil. If this is done just as the shoots begin to appear above the soil it will last until the tissues of the plants harden, after which the birds usually leave them unmolested.

Beds of Asparagus and Rhubarb are now needing little attention, as the plants are maturing their growths prior to going to rest. As the tops of the Asparagus plants yellow off they should be cut away and burnt, to avoid the seedlings springing up wherever the berries fall.

Tomato plants still require watering, and if the fruiting branches can be elevated off the ground by any method the ripening of the fruits will be facilitated as the nights grow longer and cooler. Piemelons, Marrows, Pumpkins, &c., should be harvested when ripe, otherwise they may be sun scalded. A mere shade from sun and rain are about all that appears necessary to preserve these for many months. Cucumbers will still need plenty of water, and the runners of extra vigorous plants should be pinched. Although the records of work in crossing members of the Melon family are very vague, it is always safest to note and secure some of the earliest formed Watermelon for seed purposes. They usually set a few fruits earlier than the Piemelons with which they are believed to hybridize readily.

If sown very early in March the Dwarf Beans will give fair yields right into the winter, where frosts are rare. The quick-blooming sorts, such as Emperor William or Best of All, if obtainable, would prove most suitable. Keep all developed pods plucked from plants when seed raising is not desired. Continue to apply abundance of water to these crops, and stir the surface of the soil as often as practicable.

ORCHARD NOTES FOR MARCH.

By Geo. Quinn, Horticultural Instructor.

The harvesting and storing, or packing for export, of apples and pears will form the chief work of the month in the cooler districts, while the grapes and almonds will occupy the time of the orchardist in drier localities. If it were not for the constant accession of newcomers into the business of fruitgrowing, these notes would be superfluous and vain repetition, as very little in the shape of new facts can be enumerated. In February Notes reference was made to the value of gathering apples suspected of developing "brown pitting" a week or two before packing them for a long voyage. This practice is also to be recommended for apples intended for storing. The codlin moth infected specimens, as well as those affected by the "pitting," will then be more readily detected. One of our most successful growers has for a number of years followed the practice of picking the fruits into cases and allowing them to stand in the shade for a week before being finally stored away. He assures me the improved keeping qualities of the stored fruits gained by the elimination of these injured specimens makes the practice remunerative.

The storehouses used by our applegrowers are behind the times, when compared with the progress made in other operations connected with the orchard. The codlin moth trouble has quite altered this aspect of the question. Prior to the advent of this insect almost any structure could be used with fair success, and apples kept as long as the wants of the fruit trade demanded. Now, however, the storehouse offers a good opportunity of circumventing this pest. To attain this object it must be constructed so that the escape of the moths can be prevented. We gather our apples and pears at a time when the temperature is declining; so that the exclusion of heat by any special means is not of very great importance. Draughts and strong light must be kept out. The former will cause the fruits to shrivel, and the latter will hasten ripening more especially in the pears. Apples keep quite well enough when heaped carefully on the shelves to a depth of 1½ feet. If draughts enter the building this saves the shrivelling very considerably. This method is not so exact and attractive as the one-layer style of older lands, but it is more economical of space and shelving, and keeps the fruits until they bring a price as high as our consumers are agreeable to pay.

Much depends on the sorting and handling prior to storing. It is needless to say the fruits must be handled with great care. Once the skin of an apple is broken after maturity is reached decay will set in. The longest keeping kinds or the smaller specimens of certain kinds should be placed in the bottom position, or where they must come out last. The large fruits of long-keeping kinds, or the sorts with a poorer reputation for keeping, should be placed where they are readily reached, and used up first. Amongst the longest keeping sorts Stone Pippin, Cleopatra, Rokewood, Shockley, Nickajack bea: the best reputation locally.

The pears require more careful manipulation than apples. The skin of a pear does not appear to be so "leathery" as that of the apple. The pressure given in packing that will only make a bruise, which will dry up on an apple, will break the skin of a pear, and at once open the way to immediate decay. With the exception of small specimens of Uvedale's St. Germain and Vicar of Winkfield, scarcely any pears keep well unless laid on the shelves in single layers, and then most sorts are best stood in the "crown" ends, with the stalk upwards. The more delicate sorts should not even touch each other. A room for storing pears should have two compartments. The main store should be cool and absolutely dark. The other room should be somewhat warmer, keeping a temperature something like any ordinary dwelling house maintains, and into which a fair volume of light may be admitted. This is the ripening room, into which the fruits may be brought to be prepared for immediate local consumption.

The summer has been particularly favourable for scale insects. Breeding operations have been going on apace. For checking the common black scale (Lecanium oleae) there is nothing like thinning out the dense growth of twigs and letting strong sunlight and air enter freely. After this an occasional spraying of kerosine emulsion or resin wash will usually suffice. For the red or round scale on the citrus trees, these remedies are fairly successful, but they do not compare with the fumes of hydrocyanic acid gas generated within a tent, enclosing the tree. The objections to this are the cost of the gastight covers, and the poisonous nature of the gas and the chemicals from which it is generated, and the work also can only be performed with safety to the tree upon cloudy days or at night. Although fully believing that ultimately it must supersede the spray washes, one must deal with the present condition of things. For the small grower the spray pump will doubtless remain for some time the chief weapon in fighting this pest. The present is the best period to spray for this scale. Before spraying, the trees should be freed of all dense twigs and dead shoots, so that the spray may be distributed throughout the bodies of the trees. The work is only done thoroughly when every part of each leaf or limb is completely wetted with the spray. From actual tests the writer considers the resin wash superior to kerosine emulsion made in the ordinary manner. Others speak highly of the value of kerosine when mixed with water under pressure by special attachments to the spray pump.

The citrus trees demand careful attention just now. Besides the spraying where scale insects are present, water must be given from time to time. The practice of mulching the surface with manure or organic matter has much to commend it: but unless removed at the end of each summer it must produce awkward situations, and, besides drawing the roots to the surface, render anything like thorough stirring of the soil practically impossible. I believe in the course of time our citrus cultivators will put the organic matter deeply —as far as cultivation is considered—into the soil to hold the moisture and roots below the line of annual tillage. This may be done gradually by placing the manure in the bottom of the deep rings or furrows used in irrigating and by thoroughly mixing it with the soil when breaking up the bottoms of the furrows.

It is not advisable to keep the peach and apricot trees growing vigorously late into the season. Those from which the fruits have been gathered, and on which the flower buds are readily seen in the axils of leaves apparently healthy and well developed, should not be restarted by watering, but allowed to sink gradually to rest. The loquat, on the other hand, will soon begin to push out its flower spikes, and consequently on the plains will be benefited by the presence of plenty of moisture. In the later localities young apple and pear trees of a vigorous habit may be summer pruned early in March without much fear of secondary growth being developed.

The ties upon branches or stems of recently budded trees should be looked to carefully, and loosened or removed, as the case demands. Probably more buds are killed by neglecting this portion of the operation than by bad cutting or careless insertion. If the sap is still active, buds may yet be inserted into pretty well all kinds of fruit tree stocks. These buds must remain dormant over the winter season.

Towards the end of March is a good time to set out citrus trees. Water should be available for soaking the ground, and, providing the lifted trees are not carried too far or the soil removed from their roots, a very slight check should be received. The codlin moth is less severe than during former years. This was to be expected after the scanty crop of apples and pears borne last year. Those who have sprayed as late as January have secured good results; but where only the early dressings were given the insect has increased vastly since the advent of the second brood.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of February, 1903:—

Adelaide	0·99	Manoora	0·99	Macclesfield	1·20
Hawker	0·13	Hoyleton	1·02	Meadows	1·28
Cradock	0·35	Balaklava	0·95	Strathalbyn	1·04
Wilson	0·10	Port Wakefield	0·56	Callington	0·90
Gordon	0·20	Saddleworth	1·12	Langhorne's Bridge	0·93
Quorn	0·45	Marrabel	0·93	Milang	1·51
Port Augusta	0·32	Riverton	1·39	Wallaroo	0·76
Port Germein	0·23	Tarlee	0·87	Kadina	1·39
Port Pirie	0·41	Stockport	0·65	Moonta	1·03
Crystal Brook	1·55	Hamley Bridge	0·56	Green's Plains	0·60
Port Broughton	1·20	Kapunda	1·15	Maitland	1·79
Bute	1·08	Freeling	1·32	Ardrossan	1·17
Hammond	0·55	Stockwell	1·72	Port Victoria	1·30
Bruce	0·23	Nuriootpa	2·01	Curramulka	0·51
Wilmington	0·87	Angaston	1·88	Minlaton	0·50
Melrose	0·95	Tanunda	1·42	Stansbury	0·25
Booleroo Centre	0·54	Lyndoch	1·72	Warooka	0·14
Wirrabara	1·17	Mallala	0·45	Yorketown	0·59
Appila	0·72	Roseworthy	1·13	Edithburgh	0·56
Laura	1·67	Gawler	1·82	Fowler's Bay	0·14
Caltowie	1·47	Smithfield	1·40	Streaky Bay	0·18
Jamestown	1·32	Two Wells	0·74	Port Elliston	0·45
Gladstone	1·55	Virginia	0·99	Port Lincoln	0·93
Georgetown	2·07	Salisbury	1·54	Cowell	0·23
Narridy	1·57	Tea Tree Gully	1·86	Queenscliffe	0·70
Redhill	1·69	Magill	1·44	Port Elliot	2·62
Koolunga	1·90	Mitcham	1·45	Goolwa	2·00
Carrieton	0·77	Crafers	1·55	Meningie	2·42
Eurelia	0·54	Clarendon	1·74	Kingston	2·08
Johnsburg	0·48	Morphett Vale	1·43	Robe	1·89
Orroroo	0·53	Noarlunga	0·88	Beachport	2·41
Black Rock	0·60	Willunga	0·82	Coonalpyn	2·00
Petersburg	0·57	Aldinga	0·97	Bordertown	1·15
Yongala	0·78	Normanville	1·25	Frances	1·27
Terowie	1·15	Yankalilla	1·09	Naracoorte	2·27
Yarcowie	1·41	Eudunda	0·64	Lucindale	1·94
Hallett	1·52	Truro	1·71	Penola	1·66
Mt. Bryan	1·78	Mount Pleasant	1·15	Millicent	2·25
Burra	1·50	Blumberg	1·11	Mount Gambier	2·22
Snowtown	0·68	Gumeracha	1·23	Wellington	1·37
Brinkworth	1·05	Lobethal	1·45	Murray Bridge	0·71
Blyth	0·93	Woodside	1·07	Mannum	0·50
Clare	1·69	Hahndorf	1·11	Morgan	0·54
Mintaro Central	1·44	Nairne	1·11	Overland Corner	0·97
Watervale	2·20	Mount Barker	1·31	Renmark	0·95
Auburn	1·35	Echunga	1·22		

DEPARTMENTAL NOTES AND WORK.

The discussion of the circular from the Secretary for Agriculture dealing with the resolutions of the Officers' Conference has taken up a large portion of the Bureau meetings during the past month. Where no other business of importance was transacted the report of the branch will not appear in this issue of The Journal, as it is intended to publish at a later date the decision of each branch on the various resolutions. A better idea will be formed of the opinions of the branches in this way than if each report were published separately.

The slaughter house at the College is now a reality. It is a neat, convenient little building, 12 ft. by 17 ft., with flyproof hanging room at the south, a cement floor, with splendid drainage, and provided with means of ventilation.

Examinations closed on February 24. Competition for medals is quite sharp, there being several in the third year near the top. No one can pick the winner before the last points are given in. Several old students took examination in studies necessary to pass for the diploma.

Mr. Jarman, who has been connected with the College farm for the past 12 years, tendered his resignation as farm foreman on January 30, requesting that it take effect on March 31. Mr. Jarman possesses rare qualities as a workman, and leaves behind him many monuments of his skill in performing farm operations.

The Professor of Agriculture has attended meetings of Agricultural Bureaux during the past month at Reeves' Plains, Brinkworth, Crystal Brook, and Golden Grove, and attends at Mannum on the 25th.

The Conferences of the Agricultural Bureaux held at Brinkworth, Crystal Brook, and Mannum, during February, were fairly well attended on the whole, though there was not as many representatives from the Branches as might have been reasonably expected at Brinkworth and Mannum. The meetings themselves were instructive and interesting. Professor Towar and Mr. Thomson attended all three, and Mr. Quinn was present at Crystal Brook and Mannum. Owing to the date fixed for Strathalbyn Conference clashing with date of Mount Gambier meetings, the former has been postponed till Wednesday, April 1. A report of the proceedings of these Conferences will be issued as a special supplement to the Journal after the Strathalbyn Conference is held.

During February Mr. Quinn has inspected the plot at Angaston on which a spraying test for the suppression of the codlin moth is being carried out. He reports that the results promise to be satisfactory. He has also visited orchards in the districts of Angaston, Nuriootpa, Tanunda, and Norton's Summit, to note the results of spraying carried on by apple growers for the same purpose. The third year students at the Agricultural College, Roseworthy, have been examined in fruit culture, and with the Principal of the College a plan of procedure for the establishment of a vegetable garden at the College decided upon. A demonstration of summer pruning has been given before a number of gardeners at Norton's Summit. A visit was paid to the estate of Messrs. H. W. Morphett & Co., at Wood's Point, below Murray Bridge, and photographs illustrative of the crops of vegetables and fodder grown by them were secured. The Conferences of Agricultural Bureaux held at Crystal Brook and Mannum have been attended, and addresses given upon "Irrigation and cultivation as applied to fruit trees" and "How to deal with some common garden pests."

During the month Inspectors Brown and Rowell have been busily engaged in inspecting fruits, plants, and vegetables, imported into or exported from South Australia to the adjoining States. The exports comprised 12,293 cases of fruits, 9 parcels of plants, and 3,227 packages of vegetables. Of the fruits upwards of 8,560 cases were sent to Broken Hill, and all of the vegetables were consigned to that district. The imports consisted of 1,248 cases of fruits and 16 parcels of plants. The fruits consisted mainly of bananas, while a few pineapples, passion fruits, and Italian citrus fruits made up the remainder To enable a closer examination of the imported fruits being made the services of another Inspector were required. Inspector Rowell was appointed at the end of January, and has since carried on the inspection of exported fruits which permits Inspector Brown to devote nearly the whole of his time to the examining of imported fruits. The bananas are now unpacked and recased, all overripe specimens being discarded. The rejected fruits are chopped up, sprinkled with carbolic acid, and buried deeply under the tidal height in the waste land near the inspecting room.

In the country districts the Orchard Inspectors have been engaged visiting orchards affected by codlin moth. In the Mount Lofty Ranges Inspector Monks has paid 285 visits to orchards during the 19 days he has been inspecting. Inspector Trimmer has devoted 25 days to making 205 visits to orchards and gardens in the Barossa districts. At Penola and Coonawara Inspector Pounsett has visited 93 orchards during the 12 days he has been at work. In the districts around Clare Inspector Kelly has spent 9½ days in visiting 53 orchards and gardens. The researches of these officers show that the codlin moth is slowly but surely spreading into the gardens in their respective localities. At the same time it is gratifying to note the uniformly good results that are being obtained by the growers in each of these districts, who have intelligently used the arsenical sprays against this pest. It is certain that at the end of the season much valuable evidence will be available respecting the uses of this remedy.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report on March 2:—

February came in during a very hot spell, which, however, soon gave way to a cold change, since which the weather has been so unusually mild that a record cool summer seems assured unless March proves much warmer than average. At mid-month fine general rains fell over a great portion of the drier districts of Australia, in which this State particularly benefited. Being succeeded by cool weather the moisture not only stimulated the native feed, bush, and grass, but following previous good rains has kept great tracts of our country green throughout the summer months to a degree most unusual.

It is a long time since it could be positively asserted that South Australia's commercial position was really better than that of her populous and hitherto more prosperous neighbours, but the cycle of fortune seems to be giving this State its good turn at present, though unfortunately still excepting the drier portions, which locally are termed as being outside Goyder's line of rainfall. Wheat yields generally have bagged up to expectations, and the big price ruling is giving hundreds of farmers a more profitable return than has fallen to their lot for many a year past. Business in the city as well as in favoured country districts is satisfactory, and the steady upward movement in value of copper and lead is further stimulating the efforts of miners for these metals. The event of the month, however, has been the excitement on the mining exchange caused by glowing reports received from the Arltunga district, where it is asserted that some wonderfully extensive finds of rich gold ore have been made. The field is situated nearly in the centre of Australia, in the Northern Territory of S.A., close to the overland telegraph line, at a distance of about 350 miles beyond the present terminus of the railway, which it is intended to continue on to Port Darwin. Payable gold has been obtained in the district for many years past, but only now is it claimed they have discovered extensive deposits. The climate is fine and healthy, has a fair rainfall, and water is easily obtained by sinking. The opening of a payable goldfield in that neighbourhood would quickly lead to the extension through of the overland railway to the Northern Territory.

In breadstuffs, European markets have ruled steady, but strong, on red wheats, whilst for Californian white extreme prices are being paid in comparison with other grades, in consequence of the absence from Europe of Australian wheats this season.

and the fact of Australia and South Africa taking large quantities of Californian, which otherwise would have been available for mixing to necessarily improve the colour of their flour in Europe. During the past month the principal trade in the Commonwealth has been the sale of Argentine wheat, large orders for which have gone forward, and it is probable that next month a steamer will arrive from Buenos Ayres, calling first at Adelaide, and landing the balance of her wheat at Melbourne and Sydney. This variety is new to Australia, a sample shipment having only reached Sydney last month, but it has been tried by millers, found to mix well, and to the satisfaction of bakers. The cost, it is understood, will be something like 10d. per bushel below present wheat values here, even after paying freight, duty, and all landing charges. In local wheat large shipments continue to be made eastward, chiefly in fulfilment of sales made earlier in the season, most of the new business booked being for seed purposes, for which South Australian wheat seems to be desired, representatives of Queensland farmers alone having lately bought about 100,000 bushels here. Melbourne and Sydney millers are keeping clear of stocks in anticipation of their purchases from America, which are beginning to arrive. Local quotations during the month have been unaltered, but as buyers are not so keen now, values cannot be reported as firm. Only a hand-to-mouth trade doing in flour for local use. In forage trade is rather quiet, millers' offal dull, and values weakening. The West Australian market is at present closed to us through shipments of bran and pollard from India having filled up our western neighbours at cheap rates. Exportation of chaff is mostly confined to the completing of contracts made when the value of hay on this market was lower. At present quotations shippers are unable to operate, so that Sydney, the main outlet for us, is at present filling her wants from Victoria and Tasmania. Feeding grains quiet, but values hardly changed, as stocks are not heavy and are well held.

Shortening supplies of local potatoes as the month went on gave South-Eastern growers the opening needed for their ripening crops, so that heavy deliveries are making, some Gambiers being shipped to Western Australia, where local supplies have already cut off short of requirements. The area this year under potatoes in this state shows substantial increase, and crops, especially in the Gambier district, are expected to dig well. Values have steadily dropped throughout the Commonwealth, Adelaide quotations easing 10/ during the month. Onions have continued plentiful and cheap, but no relief could be obtained by exportation, as most samples were not dry skinned enough for shipment.

More than usual heavy business done in Dairy Produce during the month. The seasonable shrinkage in supply of butter caused values of new made to gradually move up a couple of pence, in spite of the very heavy older stocks that are stored in refrigerators on account of speculators. The summer rains that have fallen throughout the leading dairying districts in the Commonwealth have so stimulated the growth of feed that milk supplies are keeping up, and the quantity of fresh made butter filling the needs of consumers without drawing to any appreciable extent on the stocks of stored. This renders the outlook for holders of stored butter not too rosy, and while newly made will maintain value and even advance a little, the heavy holdings of spring packed held in cold storage throughout Australia must prevent the seasonable advance in price that usually begins to show at this time of year. No relief can be obtained by shipment either, except at heavy loss, as the European butter markets are below average, and falling, so that everything points to the probability during the coming winter of cheap butter to the consumer. The seasonable advance in price of eggs duly affected this line as Lent approached, an improvement of 5d. per dozen being shown in about 10 days. A recovery in cheese values in Melbourne quickly sent quotations up correspondingly here, good trade doing. The decline in bacon and hams seems now to be arrested, and as stocks are not heavy, and the price here lower than with our neighbours, we look for a slight recovery, meanwhile brisk business doing. This being the alternately short supply year of honey, holders have stiffened, with the result that a firm advance in value has been established. Beeswax very saleable. Almonds have been rather quiet, but the new crop being now delivered is attracting increased attention to the line.

There is a good outlet in the city for half-fat and poor poultry amongst feeders, many of whom prefer their own fattened stuff, but owing to the high price of grain this season country people have been sending forward too large a proportion of their surplus stock in poor condition, and thus seriously depressing the market, although there can readily be cultivated a good export demand for well-conditioned frozen poultry. The increasing attention that is being bestowed on egg production makes this subject of the disposal of the surplus stock of the poultry yard a matter of some importance to our producers, therefore every phase of the industry deserves attention. In years of cheap grain of course this difficulty is not so likely to present itself.

MARKET QUOTATIONS OF THE DAY.

Wheat.—At Port Adelaide, shipping parcels, 5/9½, 5/9¾ f.o.b.; farmers' lots, 5/8 on trucks, per bushel 60 lb.

Flour.—City brands, £11 15/ to £12; country, £11 5/ to £11 10/ per ton 2,000 lb.

Bran, 1/5; pollard, 1/7½ per bushel of 20 lb.

Oats.—Local Algerian and dun, 3/ to 3/3: prime stout feeding whites, 3/6 to 3/8 per bushel 40 lb.

Barley.—Malting, 4/9 to 4/10; Cape, 3/2 to 3/6 per bushel 50 lb.

Chaff.—£5 to £5 5/ per ton of 2,240 lb., bags in, f.o.b. Port Adelaide.

Potatoes.—Locals, £3 15/ to £4 5/; Gambiers, £3 7/6 per 2,240 lb.

Onions.—Local, £3 10/ to £4/ per 2,240 lb.

Butter.—Creamery and factory prints, 1/1½ to 1/3½; private separator and best dairy, 1/1 to 1/2; well-graded store, 10½d. to 1/; Victorian bulk, 10d. to 1/ per lb.

Cheese.—S.A. factory, 6½d. to 7½d.; prime imported, to 9d. per lb.

Bacon.—Factory cured sides, 8½d. to 9d.: farmers' lots, 7d. to 7¾d. per lb.

Hams.—S.A. factory, 10d. to 10½d. per lb.

Eggs—Loose, 1/1½; in casks, f.o.b., 1/3½ per dozen.

Lard.—In bladders, 7½d.; tins, 7d. per lb.

Honey.—2¾d. per lb. for best extracted in 60 lb. tins; beeswax, 1/2 lb.

Almonds.—Fine softshells, 4½d. to 5d.; kernels, 9d. to 9½d. per lb.

In live poultry, well-conditioned table roosters fetched 2/1 to 2/7 each; good hens and cockerels, 1/ to 1/6; poor and small fowls, 8d. to 10d.; ducks, 1/1 to 1/10; geese, 2/ to 3/; pigeons, almost unsaleable at 3d.; turkeys, from 6d. to 8½d. per lb. live weight for ordinary to good table birds.

Above quotations, unless when otherwise specified, are duty paid values on imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

DATES OF MEETINGS OF BRANCH AGRICULTURAL BUREAUX.

With a view of publishing in the "Journal" the dates of meetings of the Agricultural Bureaux, Hon. Secretaries are requested to forward dates of their next meeting in time for publication.

Branch.	Date of Meeting.		Branch.	Date of Meeting.	
	1903.	1903.		1903	1903.
Arthurton	Mar. 19	April —	Mount Compass	Mar. 14	April —
Balaklava	14	11	Mount Remarkable	12	9
Booleroo Centre	10	7	Murray Bridge	13	—
Boothby	10	—	Nantawarra	11	8
Bowhill	7	—	Narridy	21	—
Burra	13	—	Norton's Summit	13	10
Cherry Gardens	10	14	Onetree Hill	13	10
Clare	13	10	Penola	14	11
Colton	7	4	Port Elliot	21	18
Crystal Brook	14	—	Port Lincoln	20	17
Eudunda	16	13	Pyap	11	—
Finniss	2	6	Quorn	14	—
Forest Range	12	9	Red Hill	10	—
Gawler River	13	10	Reeves Plains	13	10
Gladstone	14	11	Rhine Villa	13	10
Hartley	13	—	Richman's Creek	16	—
Inkerman	10	7	Riverton	7	11
Johnsburg	7	11	Saddleworth	20	17
Kanmantoo	13	10	Stockport	9	6
Kapunda	12	4	Strathalbyn	16	20
Kingston	7	9	Wandearah	9	6
Koolunga	7	4	Whyte Yarcowie	21	18
Lyndoch	12	—	Willunga	7	4
Maitland	7	4	Wilmington	11	8
Mount Bryan East	14	—	Woodside	16	—

AGRICULTURAL BUREAU REPORTS.

Burra, February 13.

Present—Messrs. Field (chair), Duldig, Flower, Heinrich, Arnold, Hawkes, Dawson, McDonald, Goodridge, and Harvey (Hon. Sec.).

Wheat Experiments.—Mr. Hawkes furnished report from Mr. R. E. Roberts, of Tothill's Belt, on Majestic, Silver King, and Ranjit wheats from the Bureau; the yields in each case were good. Members considered that it would be more satisfactory if the Bureau could distribute larger parcels of seed for experimental purposes as it was very difficult for a farmer to give a few ounces of wheat a proper trial.

Bunt.—Members had noticed that in a number of instances last season portions only of the ear were affected by bunt; sometimes every grain on one side was affected, and the other side of the head was quite free.

Manures.—Mr. McDonald reported having averaged 19 bushels of wheat per acre where he used 1½ cwt. per acre of super. He was convinced that the heavy dressing was profitable, and intends to give an equal dressing this year.

Poultry.—Mr. Dawson advocated pure bred poultry for farmers, but they must be of strong constitution; this was the first consideration. He had very satisfactory results from paying careful attention to the breeding of three or four varieties of fowls. Mr. Heinrich was opposed to pure bred fowls on the farm, except for crossing purposes.

Strathalbyn, February 16.

Present—Messrs. M. Rankine (chair), W. M. Rankine, Tucker, Meikle, Mules, Sissons, Cockburn, Watt, Reid, and Cheriton (Hon. Sec.).

Southern Conference.—Owing to the South-Eastern Conference having been fixed for March 26, it was decided to alter the date of the Southern Conference to Wednesday, April 1.

Harvest Results.—A long and interesting discussion took place on reports on harvest results; further discussion postponed.

Next meeting to be held on March 16.

Mount Gambier, February 7.

Present—Messrs. Mitchell (chair), Clarke, Barrows, Ruwoldt, Williams, Edwards, Wilson, and Lewis (Hon. Sec.).

Stooking Hay.—Discussion was continued on damage by rain to stooked hay. Mr. Clarke stated that near Ballarat he noticed the sheaves stacked head downwards; he never saw this done before, and thought possibly it was done on the outside of the stook to protect the inside against rain. Mr. Ruwoldt said he had known the stooks to be built this way to prevent cockatoos getting the grain. The Chairman said that if the heads were left in contact with the damp ground, the grain would soon start to grow.

Salt for Sheep.—Mr. Williams quoted results of experiments in France to test the value of salt in the dietary of sheep. It was found that sheep receiving half an ounce to three-quarters of an ounce of salt daily, produce more and better wool than sheep not receiving salt. Mr. Clarke said careful experiments in France had also shown that sheep receiving salt improved rapidly in condition.

Cattle Complaint.—Mr. Clarke stated that one of his cows showed symptoms of impaction; he gave her seven packets of salts with a pound of molasses, with the result that she had recovered. Sour milk and bran as a purgative, and new milk and meal afterwards, was mentioned by Mr. Williams as having cured animals affected by this complaint.

Balaklava, January 10.

Present—Messrs. Manley (chair), Anderson, Reid, Thompson, Smith, Tilier, Neville, Hams, Thomas, Vivian, Baker, Burden, Black, and Sage (Hon. Sec.).

Hon. Secretary.—Mr. E. M. Sage tendered his resignation as a member of the branch on account of his removal from the district. Members expressed regret at losing Mr. Sage, and accorded him a hearty vote of thanks for his services as an active member and as Hon. Secretary for the past seven years. Mr. J. Black was elected Hon. Secretary.

Reeves Plains, January 9.

Messrs. George (chair), Jenkins, Cordon, Oliver, Worfel, Arnold, Marshall, Henry, W. and Hubert Day, McCord (Hon. Sec.), and several visitors.

Improvement of Wheat.—Mr. R. Marshall, sen., read a paper on improvement of wheat by cross-fertilisation and selection. He described the method adopted in "crossing" wheats, and showed how it was possible to get the good qualities of several different wheats in a single variety. They had secured good yielding and rust resisting wheats, but flour strength had not received much attention. The flour strength of wheat is determined by the quantity of water a given quantity of flour will absorb. For instance, 200 lb. Purple Straw flour will absorb 45 quarts of water, while the same quantity of Jonathan flour will absorb 68 quarts. The flour strength of these two wheats is stated therefore as 45 and 68 respectively. In other words, 200 lb. of Jonathan flour will produce up to 329 lb. of bread, while the same quantity of Purple Straw flour will only produce 279 lb. With bread at 3d. per loaf Jonathan flour was worth £3 2/6 per ton more than the other. This represented an enormous annual loss to the State due to the cultivation of weak-floured wheats. Mr. W. Day said it seemed to him that these strong-floured wheats would benefit only the baker; the consumer would have to pay for the extra water in the bread, and the farmer would get no more for Jonathan wheat than for Purple Straw. The Chairman thought the millers to blame for the growth of the weak-flour wheats, as if they gave, say 1d. per bushel, more for the better wheats there would be some inducement to farmers to grow them.

Holder, January 17.

Present—Messrs. Rowe (chair), Jones, Green, Rogers, Wood, Jaeschke Pickering, Odgers (Hon. Sec.), and three visitors.

Hon. Secretary.—Mr. Odgers tendered his resignation as Hon. Secretary and member, as he was leaving the district, and received a hearty vote of thanks for his services to the branch. Mr. J. Green was appointed to fill the vacant position.

Ringbarking Currants.—Mr. Green stated that all the vines treated had formed good bunches, which were in marked contrast to the fruit on the untreated vines.

Yorketown, January 10.

Present—Messrs. A. E. Anderson (chair), Domaschenz, Jung, Koth, Bull, Davey, C. Anderson, Lloyd, and Newbold (Hon. Sec.).

Standard Sample of Wheat.—Members examined the sample received from the Chamber of Commerce, and discussion ensued. Mr. Davey thought samples should be fixed for different districts, especially in rusty years, when there was such a marked variation in the quality of the wheat grown in the different parts of the State. Members generally agreed with Mr. Davey on this matter.

Mount Gambier, January 10.

Present—Messrs. Mitchell (chair), D. Norman, sen., D. Norman, jun., Wilson, Kennedy, Williams, Wedd, Watson, and Lewis (Hon. Sec.).

Conference.—It was decided to hold the Annual Conference of South-eastern Branches on March 26.

Wheat Experiments.—The Chairman tabled samples of Marshall's No. 3 and Dart's Imperial, wheat, grown on his farm. The latter had long, heavy heads, and would average 35 bushels per acre. It was quite free from rust, but Dart's Imperial was very rusty and the heads shrivelled.

Botfly.—In reply to question, Mr. Williams stated that the botfly was very prevalent around Glencoe, and at a recent sale quite a number of horses got so frightened that they broke away. He had seen Mr. Desmond's statement that it was most exceptional for horses to die as a result of the attacks of bots, but Mr. Williams was quite satisfied that in one case he examined death was directly due to bots.

Damage to Hay by Rain.—Some discussion took place on damage done by the late rains, and how best to minimize loss under similar conditions. Mr. Norman, jun., said the loss would have been less had the crops been cut a little later; the greener the hay the more it was damaged. The Chairman suggested smaller sheaves, not tied so tightly as was often done. Mr. Wedd's crop was dry on the slopes and green in the hollows when he cut it; it was only the latter that was discoloured. It was agreed that wheaten hay had been damaged more than oaten hay, and this was attributed to the fact that the latter was always cut riper than wheaten hay.

Golden Grove, January 22.

Present—Messrs. Smith (chair), Bartle, Ross, Woodhead, Buder, McPharlin, Robertson, Mountstephen, and Coles (Hon. Sec.).

Membership.—Regret was expressed at death of Mr. John Smart, who was one of the original members of the branch.

Field Trial.—On Thursday, February 19, an interesting field trial of cultivating implements was held at Messrs. Smith Brothers' farm, Mr. W. Bartle, of Gilles Plains, having several of his ploughs at work. It is claimed that these ploughs are of exceptionally light draught, and at the same time strong and durable. In a stony patch of ground the five-furrow plough was drawn by five horses, and did good work. The Triumph plough, 12 furrows, with seed and manure attachment, created considerable interest. A 10-furrow plough, owned by Messrs. Smith, was also shown at work. A large number of visitors attended the trial, and also inspected the farm. The crops of summer fodder were a surprise to many; the condition of the land generally and the methods of cultivation were favourably commented on. In the afternoon Professor Towar gave an address on cultivation to conserve moisture. He considered that the cultivation as seen in the garden and on the fallows that afternoon was nearly perfect; on the fallows he thought Messrs. Smith would require to reduce the mulch to 1½ in. to 2 in. before seeding. There should be firm soil under the seed, but loose above. The hayshed contained 100 tons of hay equal to anything he had seen in the State. By promptly storing the fodder it had not been injured by storm, and he commended the practice to the visitors.

Renmark, January 22.

Present—Messrs. Taylor (chair), Nuthall, Johns, Geneste, Kelly, Millar, and Cole (Hon. Sec.).

Annual Report.—Eight meetings held; average attendance, five; papers read, six. The Hon. Secretary commented on apathy of members; on four occasions meetings could not be held owing to poor attendance. The Chairman resigned as he was leaving the district, and Mr. Cole also tendered his resignation as Hon. Secretary. It was decided that all members missing three consecutive meetings be struck off the roll.

Inkerman, January 13.

Present—Messrs. Smart (chair), Board, Fraser, Lomman, C. H. and C. E. Daniel (Hon. Sec.), and three visitors.

Harvest Reports.—Mr. Smart's best returns were from Cowan's Purple Straw Wheat, with Steinwedel and Gluyas Early second and third. As fa' as he could see he got just as good a crop where 56 lb. of super was used as where 70 lb. per acre was applied. Mr. Fraser also spoke highly of Cowan's Purple Straw, but of the early wheats he considered Steinwedel the best of all, notwithstanding its fault of shedding grain. Other members agreed. Neumann's and Dart's Imperial were also favourably commented on, and it was generally agreed that 56 lb. of super per acre was enough to apply here on heavy ground, but on sandy land more could be profitably used.

Whyte-Yarcowie, January 24.

Present—Messrs. Dowd (chair), Kornetzki, Hunt, Faul, Mudge, Mitchell, and Boerke (Hon. Sec.).

Cattle Complaint.—It was stated that although a number of farmers lost some cattle from impaction in 1897, there had been no deaths lately. A member said he cured a calf by administering kerosine and oil, and feeding it for a time on milk.

Best Wheats.—For this district members favoured Smart's Early, King's Early, and Petatz Surprise for early wheats; Purple Straw, Red Straw, and Dart's Imperial for late crops: and Marshall's No. 3 for the latest. Some discussion took place on the effect of manure on the soil.

Murray Bridge, February 6.

Present—Messrs. Edwards (chair), Jaensch, Kutzer, W. and H. Schubert, and Lehmann (Hon. Sec.).

Experiments.—Mr. Kutzer tabled samples of Brown Spanish Onion grown on a sandhill and manured with stable manure. The onions were of good quality, and weighed up to 12 oz. each. He also reported on experiments with rust-resisting wheats supplied by the Department of Agriculture.

Mount Compass, February 14.

Present—Messrs. Jacobs (chair), Cameron, Good, C. S. and A. J. Hancock, Herring, Jenken, Gowling, Hutton, H. and F. McKinlay, Peters, Slater, and two visitors.

Exhibits.—By Mr. Slater, onions that had been stored for 12 months; by Mr. Herring, good sample of onions grown on the outlands of the swamp.

Dairying v. Potato-growing.—Mr. Gowling initiated a discussion on the utilization of the swamp land to grow feed for dairy cattle in preference to growing potatoes. They could grow enough food on four acres to keep seven cows, which would be producing revenue for at least nine months, whereas the income from the same area under potatoes would not last more than four months. Judging from past experience the cows with the by-products of dairying—pigs, calves, and poultry—would be more profitable. Most of the members agreed that seven cows could be kept on four acres, but thought it would be better to keep two or three cows, and also grow potatoes and other crops.

Hon. Secretary.—Mr. A. J. Hancock tendered his resignation, and was thanked for his services as Hon. Secretary. Mr. H. McKinlay agreed to act in his place for a time.

Swan Reach, February 14.

Present—Messrs. Brecht (chair), Arnold, Fidge, Hasse, Rowe, Baker. Hecker, and Harris (Hon. Sec.).

Experimental Work.—Circular from Secretary for Agriculture re resolutions of Officers' Conference was discussed. Most of the resolutions met with approval, and it was resolved that the branch raise funds for experimental work, provided the department will agree to subsidise same as suggested in circular.

Summer Fodder.—Mr. Fidge tabled sorghum 6 ft. in height, grown without irrigation; he believed he would get over eight tons of green stuff per acre. Mr. Arnold advised growing lucerne with aid of irrigation; from an acre plot he had been cutting half a ton a week during the past three months. Mr. Hecker had also grown lucerne, sorghum, &c., with satisfactory results where water was available.

Davenport, February 12.

Present—Messrs. Trembath (chair), Tottman, Roberts, Magrath, Brown, Lecky, Tickle, McDowell, and Pybus (Hon. Sec.).

Lucerne.—Mr. Tottman reported that his lucerne was dying out in small patches, while the plant on the rest of the field was growing vigorously. Considerable discussion ensued as to the cause; insect attack was suggested by some members, but the general opinion appeared to be that too thick seeding was the cause.

Officers' Conference.—A committee was appointed to consider and initiate discussion at next meeting on the resolutions from the Officers' Conference.

Kanmantoo, February 17.

Present—Messrs. F. Hair (chair), F. Hair, Lewis, E., R., and J. Downing (Hon. Sec.).

Cattle Complaint.—Circular from Department of Agriculture was received. Members reported that a number of cows in the neighbourhood were suffering, but from the wide difference in the symptoms exhibited by the different animals attacked it was difficult to furnish much information of any value in reply to the questions in the circular. Members thought that it would be well for a competent authority to visit some farm where cattle were affected and watch the course of the complaint through its various stages, making careful post-mortems when deaths occur.

Wilmington, February 4.

Present—Messrs. Slee (chair), Bischoff, Schuppan, Zimmerman, Lauterbach. McLeod, Noll, Broadbent, Bauer, and Payne (Hon. Sec.).

Header Straw as Horsefeed.—Mr. Broadbent had heard several farmers in Baroota district complaining that chaffed header straw produced severe scouring when fed to horses, while others who use considerable quantities state it has never affected their stock in this way. One of the members of this branch has had a similar experience, and as in the near future the probabilities are that the binder and header will be largely used, members would be glad to have the experience of residents in other districts who feed header straw to their working horses; also, an explanation as to the cause of the scouring.

Cattle Complaint.—Circular from Secretary for Agriculture re complaint in cattle was discussed. None of the members had any experience with cattle affected in the way described.

Lyndoch, February 12.

Present—Messrs. Kennedy (chair), Warren, Rushall, Woolcock, Ken, Zimmerman, A. and H. Springbett, and Mitchell (Hon. Sec.).

Cultivation of Vineyards.—Mr. H. Springbett read a paper on thus subject:—

Ploughing should be commenced not later than July; if earlier it will give the rain a better chance of penetrating to the subsoil. Striking out should be done with a single-furrow plough drawn by a good, steady horse, and should not be left to an inexperienced ploughman. A slow horse is preferable to a fast one, as the ploughman has more time to work round the vines. In striking out use leather traces and a short swing, say 18 in. long; long swings are more likely to knock off the spurs and injure the rods. Take off the large wheel and standard, turn the headpiece so that the longest part is on the left side of the plough; if the plough draws too near the vines, alter the draught a notch or two towards the right; if drawing from the vines change to the left. The ploughman can also adjust the course of the plough by pressure to the right or left as required. Two inches is deep enough to strike out along the vines; a light plough with long handles is best for this work, as it is easier to work in and out as it passes the vines. He had only used the old YOH ploughs for striking out, and these, he thought, could be improved by having movable handles and extension headpiece. After striking out do two more rounds with the single-furrow plough, then use the double-furrow. Strike out at every other row and finish at the row between. Care should be taken to strike out the following year in the row where you finish this year. If the crown of the vines are not spread very much and are not too high the double-furrow plough can take out all but one furrow, which can be taken by the finishing plough. A plough that is good for striking out is also good for finishing. To set your plough for finishing take off the little wheel and the standard, then lift the big wheel, which will let your plough lean to the off-side. Set your plough to take as wide a furrow as possible, and then should you come to a wide piece to take off, you will be able to do so without going an extra round. It is far better to have a good wide furrow left for finishing, especially on sideling ground, as you have more for the plough to grip to. If your land is stony take off the coulter. The plough will go into the hard patches better, and not slide away from the work so much. If the vines are medium size, say about 15 in. across the crown, the strip left along the row, after finishing, should be from about 6 in. to not more than a foot in width. Some people advocate ploughing vineyards twice, but he did not hold with it, as you can cultivate your land four or five times in the time it would take to plough it once, and get the land in better trim. The depth to plough should be according to the nature of the soil Where the clay is close to the surface do not turn the clay on top, for it makes the land bad to work afterwards. The best thing to do where you want to break up the clay is to turn over the loam with one plough, and follow in the furrow with another plough with the moulboard off. With a good deep loam that has been ploughed the same depth for several years you may find your plough is riding on a hard pan, which, unless the ground is fairly wet, you will have a job to break through. This pan should be broken through, and the winter rains will penetrate into the subsoil quicker and deeper, and prevent the winter rains from running away, carrying with it a lot of your top soil, and leaving plenty of small creeks. The more water that one can get into the land during the winter months the better. He did not believe in harrowing, for the reason that the land is left too level. The first rains will settle it down, and any rains that fall later will run off. If a cultivator is used the surface is left rougher and looser, and a heavy rain will go into the land. He noticed when we got that heavy rain in December that very little water had run in the vineyards they were working; the loose, fairly rough surface of the land prevented the water running away. They used nothing but a Planet Jr., No. 7, and the No. 40 Universal cultivator, finishing all the ploughing first and then starting the cultivators, crossing the ploughing, and cutting out the middles left by the plough when finishing. After every useful rain during the dry months the cultivator should be put to work to move the surface, which acts like a mulch and prevents evaporation.

Balaklava, February 14.

Present—Messrs. Anderson (chair), Reid, Thompson, Robinson, Neville, Thomas, Burden, and Black (Hon. Sec.).

The Open Bridle.—Mr. Reid initiated a discussion on the use of the open bridle in harness instead of winkers. His experience was decidedly in favour of the open bridle. [What was the general opinion of the meeting on the subject?—Ed.]

Booleroo Centre, February 10.

Present—Messrs. Nottle (chair), Steven, Michael, Repper, Arthur, Parsons, McMartin (Hon. Sec.), and one visitor.

Publication of Bureau Reports.—Discussion took place on circular from Secretary for Agriculture, and it was resolved that in the opinion of this branch the curtailment of the reports from the branch Bureaus was detrimental to the best interests of the Bureau. Members found the Bureau reports were of considerable educational value, and rather than lose the advantages of their publication they would be willing to subscribe towards the cost of printing.

Fodder Plants.—The Chairman scarified in rape and mustard seed on 70 acres last year, but the crop was a failure. He sowed some more rape seed after the December rains, and the crop did well for a time, but was now badly affected by blight. He thought rape sown on the fallows would not be all destroyed by the scarifier when seeding, and the plants would be troublesome in the crop.

Bunt.—The Chairman sowed 70 acres with unpickled seed before the rain last year, but the crop had some bunt in it, whereas the pickled seed produced a clean crop. The unpickled seed germinated better, and grew much stronger than the pickled seed. Mr. Michael's experience was the same; he wished to know whether it was better to pickle all the seed before commencing to sow, or to treat each day as much seed as would be required for the day's work? Was there any other effective pickle that would not injure the seed?

Watervale, February 9.

Present—Messrs. C. A. Sobels (chair), E. E. Sobels, Holder, Scovell, Solly, Perrin, Treloar, Hunter, Smith, Beck, and Castine (Hon. Sec.).

Hon. Secretary.—Mr. O. H. Castine was appointed Hon. Secretary, vice Mr. E. Treloar resigned.

Stock Quarantine.—Mr. Treloar reported having had his paddock quarantined; he let the feed to a stockowner, who placed diseased cattle on it with the result stated. A long discussion followed, members generally being of opinion that it was preferable to sell the feed in a paddock to taking strange cattle in at per head.

Millicent, February 5.

Present—Messrs. Stuckey (chair), Oberlander, Stewart, Hutchesson, Davidson, Hart, Campbell, Crouch, and Harris (Hon. Sec.).

Field Trial.—It was decided to arrange a field trial of various cultivating implements on Wednesday, March 18.

Reports on Experiments.—Mr. Hart tabled samples of Majestic, Allora Spring, Marshall's No. 3, Gluyas Early, and Manitoba wheats. He was exceedingly pleased with the Majestic, being a good yielder, and very resistant of rust. Mr. Campbell tabled a number of products, including the following:—Potatoes.—Queen of the Valley—Good quality, poor yielder. Duke of York—Harvested in 82 days from planting. Pink Eye Don and Thiel—Good. Up-to-date, a potato highly spoken of in England. Gratia—Two roots of this were shown with the seed (set) undecayed; one root gave 24 marketable tubers, 4 seed, and 10 small ones. Japanese Plums—Satsuma, a good cropper, solid flesh, very small stone; good for jam and preserving. Botan—Two different kinds are sold under this name, one much larger than the other, both made splendid jam, and both were excellent bearers, and came into bearing much sooner than the general run of plums. Japanese Buckwheat—This had ripe seed on in 10 weeks, and was harvested in 14 weeks from time of sowing; it had yielded heavily.

Eudunda, February 9.

Present—Messrs. Gosling (chair), Paech, J., and J. A. Pfitzner, and Marshall (Hon. Sec.).

Oats.—Samples of Algerian, New Zealand White, and Champion Oats, grown by Mr. Pfitzner, were tabled. The grain was very plump considering the season, and sold locally at 3/6 per bushel; yields varied from 4½ bags to 6 bags per acre, and average 25 bushels.

Salted Hay.—Mr. J. Pfitzner undertook to carry out experiments on behalf of the branch in the salting of hay and straw in the stack.

Woodside, February 9.

Present—Messrs. Caldwell (chair), Schroeder, Heidrich, Rolbusch, Fowler, Drogemuller, Keddie, Kleinschmidt, Lauterbach, Johnston, Pfeiffer, and Hughes (Hon. Sec.).

Standard Weight for Chaff.—It was decided to draw the attention of the Council of Agriculture to the desirableness of providing by legislation for the adoption of a standard weight for the bag of chaff.

Reeves Plains, February 6.

Present—Messrs. George (chair), Dawkins, Folland, Arnold, Cordon, Jenkins, Hancock, Rechter, Oliver, Marshall, Worfel, W. and Hubert Day, J. McCord (Hon. Sec.), and a large number of visitors, including Professor Towar and members of the Mallala branch.

Homestead Meeting.—This meeting was held at Mr. Folland's residence, the afternoon being devoted to inspection of the farm, and social enjoyment, including a cricket match between the members of Mallala and Reeves Plains branches. Visitors were entertained by Mr. and Mrs. Folland, who were thanked for their kindness.

Tillage to Conserve Moisture.—In the evening Professor Towar delivered an address on this subject. He pointed out that the farmer in South Australia had to depend practically entirely on the winter rains for moisture for his crops; the showers registering only a few tenths of an inch had no lasting effect, as the moisture was quickly evaporated. The farmer must, therefore, consider how best to conserve the moisture that falls in winter. Ploughing early to let in the winter rains was a good practice; subsoiling was likely to assist. While deep ploughing might not be practicable here, he thought the depth generally ploughed, i.e., 3 or 4 in., scarcely sufficient. He doubted whether they would lose any moisture through the rain going too deeply into the soil. Having secured the penetration of the moisture in the open soil, the next thing was to conserve it for the crops. The methods which will prevent or retard evaporation were the methods to follow to get good crops. A loose surface mulch of soil will do this. Cultivation for the conservation of moisture will pay even if there are no weeds to destroy. The question of the thickness or depth of the soil mulch had been the matter of numerous experiments, and in dry areas it was found that it should be not less than 3 in. at the commencement of the summer, gradually diminishing until seeding time to about 1½ in. There should be plenty of loose soil above the seed, but none below it. The earth mulch would not need to be disturbed if there was no rain, but after rain it should be recultivated as soon as possible. He advocated the depositing of farmyard manure on the field directly it was produced. Its fertility would then go into the soil, and none of it would be lost. Another means of securing a mulch was by the growth of vegetation. The wind was a very active agency in promoting evaporation, and vegetation, and even low stubble, would have a good effect in preserving the moisture. Although it was not possible to save very much moisture after the wheat was sown, it was found that the process of rolling had a beneficial effect. A young wheat crop could also be gone over with advantage with the light harrows. He tried it on a small patch at the college last year, but stopped it because he was afraid to do more. The results, however, were very satisfactory, as the weeds were killed and the crop looked much better than in the other parts of the same field. He believed the harrowing helped somewhat to conserve the moisture in the soil. He had been watching with interest the practice of one of his neighbours—the Chairman of the Reeves Plains Agricultural Bureau—of harrowing his wheat stubbles. Theoretically it was a good thing, and he believed it would have a satisfactory practical result. It would tend to prevent the waste of moisture. In the country where he came from four bushels per acre more was obtained from land that was cultivated immediately after reaping than from that which was left undisturbed until seed time. Speaking of the ploughing in of green manures, he would advocate it if the land was well saturated, but he recognised that there would be danger in it in dry conditions. If they could get it thoroughly mixed with the soil the organic matter of the green manure would assist in the retention of the moisture. Leguminous plants were the best for this purpose, as they took a certain amount of nitrogen from the air. On the question of level or ridged cultivation the Professor said that had to be determined by the conditions. The more ridged the land the greater the loss from evaporation, but the smaller the loss from drifting. He preferred level cultivation, excepting where there was likely to be loss of soil through drifting.

Bowhill, February 3.

Present—Messrs. Norman (chair), Weyland, McGlashan, Johnson, Waters, Whitfield (Hon. Sec.).

Cabbage Aphis.—The Hon. Secretary asked for treament of cabbages affected by this insect. [Spray with kerosine emulsion or tobacco water if the plants have not hearted, and keep them growing vigorously by means of water and manure. When the plants are advanced no treatment that would not injure them would be effective.—Ed.]

Cultivation.—The Hon. Secretary read a paper on this subject. In this locality he thought they should plough 4 to 5 in. deep; many farmers only ploughed 2 to 3 in. deep. Harrowing did not receive the attention it should. Many farmers here never use the harrows, but he was convinced that even if harrowing did not increase the yield, smoothing the ground saved a lot of wear and tear on the stripper. For hay crops the land should be rolled. Oats should be tried more in this district. Notwithstanding the dry season, he had seen some very fair crops lately.

Mallee Shoots.—Mr. McGlashan said he found that if mallee shoots were cut at this time of the year they died out.

One Tree Hill, February 6.

Present—Messrs. Ifould (chair), F. and G. Bowman, Hutchins, Thomas, Clucas (Hon. Sec.), and a number of visitors.

Homestead Meeting.—This meeting was held at Mr. F. Bowman's residence, over 20 visitors being present. An instructive afternoon was spent in inspecting the orchard, apiary, stockyards, &c. Considerable discussion took place on manuring of cereal crops, the growth of summer fodder, management of stock, &c. It was agreed that lucerne was the best summer fodder where it could be grown successfully. Mr. Hutchins had made a good many tons of ensilage from the wild artichoke, which was so plentiful in many parts. It was nourishing and succulent, and when mixed in the pit with some of the hard, wiry grasses little utilized by stock in their natural condition made very servicable ensilage. A very pleasant social evening was spent, and a hearty vote of thanks was accorded to Mr. and Mrs. Bowman.

Port Pirie, February 7.

Present—Messrs. Juers (chair), Wright, Bell, Laurie, Jose, and Wilson (Hon. Sec.).

Currants.—Mr. Jose said since last meeting he had made extended enquiries into the prospects of currant growing in this district, and was confirmed in his opinion that it was too hot and dry at ripening time for the profitable production of currants.

Annual Report.—12 meetings held; average attendance, 9.83; papers read, 9. The retiring officers were thanked for their services and re-elected.

Broadleaf Mustard.—The value of this plant for early green feed was commented on, members being advised to sow same on the stubbles and harrow it in. Members wished to know quantity of seed to sow per acre. [Sow about 5 to 6 ℔. per acre, and harrow it in lightly.—Ed.]

Wheat Experiments.—The Chairman tabled four varieties of wheat selected from 24 kinds tested. From 2 ℔. of Yandillah received two years ago he now has 10 bushels; the grain is dark and flinty. Australian Club produced 14 lb. from 8 oz. seed; grain dark and flinty; a good wheat for hay. Sunset and Carline were also shown.

Clarendon, February 9.

Present—Messrs. Jures (chair), Piggott, A. and A. A. Harper, Dunmill, Spencer, Morphett, and Wright (Hon. Sec.).

Stock.—Mr. Piggott read a paper on the most profitable stock on the farm. The best stock were the sound and healthy animals of every kind. Pedigree was not everything. In respect to the improvement of their herds it was not only a question of breeding but also of treatment. By careful milking the production of a cow can be increased; by carelessness it will quickly deteriorate. For milkers the Jersey-Shorthorn cross was most suitable, but for beef a good Shorthorn bred to ordinary large-framed cows would prove profitable. Some discussion ensued, members being divided in opinion as to most profitable breed of cows.

Willunga, February 7.

Present—Messrs. Pengilly (chair), A. Slade, J. and W. J. Binney, Kernick, Vaudry, Blacker, Allen, Atkinson, and E. M. Slade (Hon. Sec.).

Poultry on the Farm.—Mr. E. M. Slade read a paper on this subject. In keeping poultry as an adjunct to the farm purebred birds were not necessary, but it is essential that fresh blood be introduced frequently. This is best done by securing purebred roosters to run with the breeding hens. It is not advisable to go beyond the first cross with farm poultry. Instead of buying roosters it is better to get a sitting of eggs every year, and select from the chicks the best cockerel. In doing this there is no risk of introducing tick or disease, and besides it is not uncommon for the highly fed, forced produce of the fancier's yard to fare badly when turned out with the farm flock. Many people advocate the Minorca or Leghorn for farmers, but the objection to these and other light breeds was that they are strong flyers, and they also are not good layers during winter. Farmers would take more kindly to fowls if they could keep them off the haystacks and out of the stable, where they often prove a source of great annoyance. In his opinion the best fowl for the farmer was the Wyandotte. These are good winter layers, good table birds, and they cross well with most other breeds. Where possible the fowl houses should be of iron, using as little wood as possible. In this district the house should face north-east. He was not against the practice of allowing fowls to roost in trees that have good foliage all the year round; fowls do not run any risk of tick when roosting in trees. [If Mr. Slade were to examine the trees in yards where tick exists he could find vermin in great numbers under the rough bark and in the crevices. Even the pepper tree gets very badly infested and a source of great danger to the poultry.—Ed.] He found geese very profitable, but they require plenty of water. It is also advisable to grow a small plot of barley for them to forage in, as they are very destructive to wheat or other cereals when the corn is green. Fowls must be fed regularly, and unless properly looked after will prove disappointing. Mr. W. J. Binney found the Wyandotte better than any other breed he had tried for crossing. Mr. Pengilly found keeping poultry for egg production profitable, but there was very little in table poultry.

Johnsburg, February 7.

Present—Messrs. Potter (chair), Dunn, Hombsch, Luckraft, Chalmers, Masters, Caughlan, Johnson (Hon. Sec.), and one visitor.

Treeplanting.—Mr. Chalmers read a paper on the benefits of treeplanting in the north. That they could grow forest trees in the north they had proof in the condition of the trees planted in various parts on the plains and attended to until established. This was especially the case with gums, which seem to thrive on any soil not too clayey or containing too much limestone rubble. He believed it was commercially possible for them to grow forest trees. Everywhere timber, both for fencing and firewood, was getting scarcer. As, however, so many years must elapse before any return can be secured from land planted with trees, he did not think the work could be undertaken on a large scale except by the State or some one with a large amount of capital. As far as the effect of the trees on climatic conditions was concerned, nothing would be accomplished by the growing of small areas of timber. Most of the northern plains run nearly north and south, and he believed that they could temper and break the drying winds by growing long belts of trees in an east and west direction. Such shelter belts would cost a considerable amount to establish, but the benefit which would be derived would more than compensate for the outlay; besides which in years to come the work would prove reproductive. If the State, instead of spending money clearing scrub land to find work for the unemployed, had utilized this labour in the planting of belts of trees across these treeless plains they would have had a magnificent asset, and have provided an object lesson which farmers and others would have followed. Members generally agreed with Mr. Chalmers as to the value of timber belts across the plains. Opinions were divided as to whether sugar gums would thrive during dry seasons, the majority holding that once established they would be all right. There are some very healthy gums in the locality, which have continued to make excellent growth during the late dry years.

Summer Fodder.—Mr. Chalmers tabled sample of sorghum 7 ft. in height, grown from seed sown about end of October. It had not been irrigated, but a portion of the plot was flooded after sowing.

Port Elliot, February 21.

Present—Messrs. McLeod (chair), Gosden, Pannel, Brown, Welch, Hutchinson, Green, W. E. and W. W. Hargreaves (Hon. Sec.).

Landlord and Tenant.—Mr. McLeod read a paper on this subject. Between the landlords and tenants of the small farms in the south there was often a good deal of distrust, and often lack of sympathy on both sides. The landlord often charges exorbitant rents, and does not trouble how the tenant fares so long as the rent is paid. On the other hand, the tenant takes all he can out of the land, putting nothing back, and does no repairs that he is not absolutely compelled to. This state of things could be easily remedied by a little forbearance and thought on both sides. The landlord should charge a fair rent, according to the capability of the soil, and should allow no crop to be put in without a fair amount of farmyard manure or commercial fertiliser; no land should be cropped more than twice in succession; all noxious weeds destroyed, low hedges to be trimmed once a year; all improvements to be kept in good repair. The tenant should have at least a seven years' lease, with right of renewal.

Where fences require repair, let the landlord find materials and the tenant the labour. This would be fair to the landlord, as a good fence will last 30 to 40 years; it will pay the landlord to supply only good materials. The tenant should be paid for any permanent improvements erected, such payment to be in proportion to the length of the lease. If the tenant has had seven years' use of the improvements he should be allowed half their cost; if fourteen years', one-third; and if 21 years', he cannot reasonably expect any payment. Three years' leases were a curse to both landlord and tenant. The latter has no security on any improvement he makes, and if he does improve the farm he only has to pay more rent, or leave when the lease is up; he gets nothing for any improvement in the land, and consequently gets careless. This state of affairs should not exist. On a wornout farm it would take a man nearly seven years to get it into real good heart. In the south an orchard adds to the value of every farm; but, unless he has a 21 years' lease, it will not pay a tenant to plant trees.

Boothby, February 17.

Present—Messrs. Foulds (chair), Leonard, Sims, Chaplin, and Turnbull (Hon. Sec.).

Stock Complaint.—Mr. Sims reported loss of horse; on holding a post-mortem he found nearly three gallons of watery fluid under the stomach, just beneath the outer skin. The only symptoms of trouble noticed before death were swellings in the legs, general uneasiness, and frequently lying down and rolling. [The Chief Inspector of Stock says the swellings in the legs are undoubtedly dropsical, but it is not possible to give any definite information as to treatment, &c.—Ed.]

Rust-resistant Wheats.—Considerable interest was manifested in report in February Journal of Agriculture on experiments with rust-resisting wheats. Some discussion on the returns took place.

Stockport, January 13.

Present—Messrs. Watts (chair), J. Smith, Thomas, Godfree, Howard, Branson, and Murray (Hon. Sec.).

Wheat Experiments.—Members reported on experiments with wheats last season. Smart's Early, 22 ℔. sown, 3 bushels good grain harvested; the wheat came up thin and slowly; was affected by black rust. Gamma, sown with 1½ cwt. super per acre, 3 ℔. 7 oz. seed sown; yield 162 ℔. grain badly pinched; heads long. Ten ℔. Ranjit, sown on dark chocolate soil, clay subsoil, with 1 cwt. super and 1 cwt. rotten stable manure per acre, yielded 6 bushels good grain from quarter of an acre; very brittle straw; grain cracks easily, should be a good hay wheat. Seventeen ℔. Rerraf, sown on June 30 at rate of 3 pecks per acre, yielded 4 bushels of medium-quality grain; land manured with 80 ℔. super per acre; this wheat stands up well, but is too fine in the straw for hay. Seventeen ℔. Budd's Early, sown on January 30, with 80 ℔. super per acre, returned 2 bushels of grain; most of it went down badly; no good for hay, and too brittle in straw.

Wood Ashes.—Members wished to know the principal constituents of value in wood ashes; whether the ashes would be damaged by being cooled with salt or brackish water, and whether they could be mixed with super without injury. [Wood ashes are valuable on account of the potash and to a much less extent on the lime they contain. A little moisture might not do any harm, but any moisture draining away from the ashes would carry away some of the potash, and so lessen their value. Theoretically, ashes should not be mixed with super on account of the lime they contain, but Professor Lowrie on several occasions stated that if mixed with the super and used within 48 hours little, if any, injury would result, so long as the mixture did not get moist.—Ed.]

Clare, February 6.

Present—Messrs. Kelly (chair), Christison, Lloyd, Hope, Bray, Treleaven, Hague, A. P., and W. S. Birks (Hon. Sec.).

Feeding Down Wheat Crops.—Mr. Bray read a paper on this subject. As far back as 25 years ago he had seen the benefit gained by judiciously using sheep to feed down the wheat crop. On one occasion, when there was very little feed he turned the ewes and lambs into his crop to save their lives. After they were taken off, the season turned in favourable, and the wheat stooled out and grew well. On the 500 acres he averaged seven bags of wheat to the acre. Last year a large farmer near Blyth told him he had to turn his sheep into his crop to save them. He believed this crop returned nearly £6 per acre, besides saving the sheep. With the aid of manure, they were now growing heavier crops than before, and the crops were taller; in fact they were often too high to stand the rough winds, besides the stripper had to be worked as high as possible, taking in a lot of straw, besides missing a considerable number of heads. He would, therefore, advise farmers in the lower north to sow their wheat early, using rust-resisting varieties of wheat, and feed the crop down with sheep. The sheep should be put on before the crop is too high, as they will then feed it down evenly. Do not put them on after rain, as they will tread the crop into the ground. This, of course, does not apply to crops intended for hay.

Richman's Creek, February 16.

Present—Messrs. Freebairn (chair), Knauerhase, Gebert, Kelly, Knox Searle, Lehmann, McColl (Hon. Sec.), and two visitors.

Destruction of Sparrows.—Mr. Gebert reported successful poisoning of sparrows with wheat soaked in strychnine; he dissolved as much of the poison as would cover a threepenny piece, in water sufficient to soak a pint of wheat. The birds took the poison readily, and he found nearly 100 dead sparrows; his fowls had also eaten some of the grain, but apparently the poison was not strong enough to do them any harm.

Hon. Secretary (Mr. J. McColl), who had been Honorary Secretary since the inception of the branch, in 1891, tendered his resignation, as he was leaving the district. Mr. J. M. Kelly was appointed to the vacant position, and a hearty vote of thanks was accorded to Mr. McColl for his valuable services.

Narridy, February 21.

Present—Messrs. Darley (chair), Satchell, Smart, Bairstow, Smallacombe, and Dunsford (Hon. Sec.).

Sheep on the Farm.—Mr. Satchell read a paper on this subject. Sheep on the farm were not a great deal of trouble, and were decidedly profitable; they bring in good revenue, help to keep down the weeds, and reduce the butchers' bills. They do good in the stubble paddock by trampling the straw and breaking it down. They were generally more profitable than cattle to the farmer; land to keep 10 to 15 head of cattle will keep 100 ewes. Good fences and small paddocks, to enable the flocks to be changed frequently, were essential. For this district the best breed was the Merino. The larger breeds did not stand the dry seasons and shortness of feed; their wool also gets dirtier, and they do not cut as much as the Merino. Over stocking must be avoided, and the breeding ewes culled every year. Get a good ram, and don't be afraid to pay a fair price for one. Buy the ram in the wool, and know what he will cut; a good ram will produce 16 lb. or more of wool, but many farmers' rams do not produce more than 9 lb to 11 lb. Such animals must reduce the wool-producing quality of the flock. Considerable judgment must be exercised as to time of lambing; with early feed early lambs are most profitable, but on the other hand it is very poor policy to have the ewes dropping their lambs when they are coming to water. After lambing the barren ewes should be put on good feed, and sold to the butcher as soon as fit. Farmers needed to watch the lamb export trade carefully; the high price realized for first-class lambs was a strong temptation to dispose of the best, and keep the second grade for the flock. This could only result in disaster.

VENTILATION OF FACTORIES AND WORKROOMS.

CONTRIBUTED BY THE CHIEF INSPECTOR OF FACTORIES.

(Continued from page 488.)

IMPURITIES IN THE AIR OF FACTORIES AND WORKSHOPS.

The impurities passing into the air of factories and workshops can best be classified according to their source. They arise (1) from persons present; (2) from lights burning; (3) from floor, &c., of the room; (4) from manufacturing processes; (5) from accidental sources, such as escapes of gas, effluvia from drains, or impurities in the outside air.

I — IMPURITIES FROM PERSONS PRESENT.

The persons present in a room vitiate the air in several ways.

In the first place they give off carbonic acid, and at the same time consume oxygen in slightly (about a tenth) greater proportion. The amount of carbonic acid given off, and of oxygen consumed by a man varies considerably, according to the amount of work being done. Thus during greater muscular exertion the amount may, for the time, be ten times as much as during rest. The average for the 24 hours can best be calculated from the average daily consumption of food, which is pretty accurately known, and corresponds to the production of about 22 cubic feet of carbonic acid, or 0.9 cubic foot per hour. During complete rest only about 0.6 cubic foot per hour is given off, however. Hence during the hours of activity about 1.1 cubic feet per hour are produced. A woman produces a fifth less than a man. In a factory about 1 cubic foot per hour may therefore be taken as a probable average quantity per person, though a higher estimate would be needed in cases where there is much muscular exertion. It follows that, assuming the air of a workroom to be completely mixed, and allowing for the carbonic acid present (say 4.0 volumes per 10,000) in the air of a town, it would be necessary to supply more than 1.250 cubic feet of air per hour to each person in order to produce an atmosphere containing less than the 12 volumes of carbonic acid per 10,000 proposed in the preceding report.

Mere increase of carbonic acid and diminution of oxygen to the extent which actually occurs in the air of buildings has no direct influence on the comfort or health of the persons present. The proportion of carbonic acid, even where ventilation is very bad, seldom rises beyond 50 volumes per 10,000; and it requires about six times as much to produce an immediately perceptible effect (increased depth and frequency of breathing). A similar remark applies to the oxygen percentage. Neither a diminution nor an increase of 2 or 3 per cent. in the oxygen seems to produce any appreciable effect on a man. The living organism regulates its own consumption of oxygen, and in this respect differs entirely from a burning candle or fire, in the case of which the rate of consumption of oxygen rises and falls with the oxygen percentage in the air. A large fall in the oxygen percentage, or a corresponding diminution in the barometic pressure, produces the strain of symptoms known to mountaineers as "mountain sickness;" but the diminution requires to be a very considerable one. Some of the best known health resorts are at altitudes where the diminution of pressure corresponds physiologically to a diminution by fully a fifth in the oxygen percentage. Further evidence showing that a moderate increase in carbonic acid and diminution of oxygen in the air is not in itself prejudicial to health is afforded by the fact that, apart from accidents, the life of a coalminer is exceptionally healthy, although he breathes, when at work, air which contains a notable excess of carbonic acid and deficiency of oxygen owing to chemical changes in the coal. The importance of carbonic acid in the air of a building arises solely from the fact that it is an index of conditions which are usually prejudicial to both health and comfort.

It was for long believed that along with the carbonic acid in expired air an organic substance, which is poisonous when absorbed into the blood, is given off from the lungs. Careful experiments have not corroborated this theory. There is no doubt, however, of the unpleasant effects produced in the majority of persons by the air of badly ventilated rooms, and of the loss of health and increased liability to certain diseases, particularly consumption, associated with living in such air. There is also strong evidence of the influence of fresh air in both facilitating the cure and preventing the return of consumption and other diseases.

The increased liability to disease in persons living in badly ventilated rooms is in part attributable to the communication, through the air, of infective diseases; and it is evident that the greater the air supply the less will be the chance of such communication occurring if any source of infection is present. Organisms present in the mouth and air passages probably constitute the chief source of infection. During ordinary quiet breathing none of these appear to be given off in the breath, but it has recently been shown that in speaking, and particularly in coughing and sneezing, large numbers are driven into the air and carried all over the room. Animals exposed to air contaminated by the coughing of consumptive patients have also been shown to become infected with tuberculosis. Another mode of probable infection is from sputum which has been allowed to dry on the floor, so that the infective organisms are readily carried into the air as dust.

The loss of appetite, discomfort, headache, &c., produced by bad ventilation cannot, however, have anything to do with organisms, which act far too slowly; nor can the absence of such organisms explain the curative effects of fresh air in such diseases as consumption. It is evident, therefore, that other factors besides the presence of effective organisms must play an important part in connection with the ill-effects of exposure to vitiated air, though the precise nature of these factors is still somewhat obscure.

The heat of an overcrowded room evidently aggravates all unpleasant effects, but they may still be produced, though not so readily, when excessive heat is absent; and warm air by itself, particularly if it is in motion, does not produce the same effects. It is probable that the mere smell of the air of a badly ventilated room is one cause of the effects in question. This oppressive smell is usually very distinctly perceptible when the proportion of carbonic acid exceeds about 10 volumes per 10,000, or 6 to 7 volumes above that in outside air, and according to De Chaumont becomes imperceptible at about two volumes above outside air. It appears to arise partly from the breath, but largely from the clothes and persons of those present in the room, and is caused by volatile substances present in the air in such minute amount that, though easily perceptible to our senses, they cannot be detected by chemical analysis. The importance of personal cleanliness, with a view to minimising the vitiation of air, is thus evident.

Expired air arises at first, since it is warm. When it cools and mixes with pure air, the mixture has about the same specific gravity as pure air. The carbonic acid which replaces part of its oxygen tends to make it heavier, but this influence is neutralized by the increased proportion of aqueous vapour, the latter being lighter than air. Undiluted expired air contains, as compared with ordinary air, an excess of about 3.5 per cent. of carbonic acid and 5 per cent. of aqueous vapour, with a deficiency of about 4 per cent. of oxygen. The impurities arising from the persons present in a room pass upwards at first, but soon become pretty evenly distributed in the air at different levels owing to the influence of convection currents caused by the warmth of the body. This fact is illustrated by the following experiment on a room of 3,070 cubic feet capacity, and 11 feet high. Three women and one man were present in the room. The day was bright and sunny, and there was no wind; the house was in the country; all openings were closed.

	Volumes of CO_2 per 10,000 of air.
Before experiment	2.8
After 20 minutes of occupation at 4 ft. from floor	5.5
After 20 minutes of occupation at roof	4.7
After 70 minutes at 4 ft. from floor	10.9
After 70 minutes at 4 ft. from roof	11.5
After 90 minutes at 4 ft. from floor	12.8
After 90 minutes at 4 ft. from roof	12.1
After 110 minutes at 4 ft. from floor	15.0
After 110 minutes at 4 ft. from roof	15.0
After 125 minutes at 4 ft. from floor	15.3
After 125 minutes at 4 ft. from roof	15.2

(To be continued in next issue.)

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GROWING SCARCITY OF CONIFEROUS TIMBER.

By WALTER GILL, F.L.S., F.R.H.S., CONSERVATOR OF FORESTS.

(Continued from page 497.)

Bringing under review countries outside of Europe Dr. Schlich shows that most of those now importing are likely to increase their demands for coniferous timber, and that, excepting the United States of America and Canada, those exporting do not affect the question at issue, because they export hardwoods which will only find a market in Europe up to a certain quantity, seeing that 87 per cent. of the timber imported there consists of coniferous or pine timber, and therefore any possible increase in hardwood timber exports would not make up for the decrease in the light coniferous woods.

Referring to Asiatic Russia, which has been sometimes named as a possible source of supplies, he says:-

"This is a big country; it contains extensive areas which are classed as woodlands, but a great part of the country is practically situated beyond the limit of profitable tree growth, while other extensive areas are plains without forest. Supposing, however, that there is a surplus of production for export, the cost of transport would be practically prohibitive. The outlets by water are toward the North Polar sea, involving exceedingly difficult navigation, and if transported by land toward the west the distance would be very great. It is, however, not impossible that any surplus timber might hereafter go towards China."

Dealing with the United States the same writer points out that the increased demand for timber cannot be met from there for any length of time, in support of which opinion he gives the following data:—

"The total wooded area of the United States is given as 700,500,000 acres, being equal to 37 per cent. of the total area, and giving an area of nine acres per head of population. The timber standing on this immense area has been estimated, and it is given by one of the foremost authorities as equal to 3,450,000,000 tons (reckoning a ton equal to 400 ft. board measure), which gives not quite 5 tons per acre all round. In France, Germany, and Austria, this would be called about one-tenth of the average full stocking, hence the United States forests would, as regards their yield capacity for the next half-century, be equal to about 70,000,000 acres in France, Germany, or Austria. The lumber cut in 1890 is given as equal to 63,000,000 tons, and it was calculated that the existing stand of timber would last for about 50 years. For the year 1899 the cut is given as follows:—

Coniferous timber	75,000,000 tons.
Oaks and other hardwoods	25,000,000 tons.
Total	100,000,000 tons.

At this rate the available stand would last only about 34 years. If during the next 10 years the annual cut increases at the same rate as in the past 10 years, it will amount to 137,000,000 tons, and the remaining stand will be consumed in about 25 years. Again, the annual production has been estimated at 75,000,000 tons, so that the present annual consumption exceeds it by 33 per cent. It is stated that besides the cuttings large quantities of timber are destroyed annually by fire and other sources of loss, so that it is altogether probable that the annual growth is considerably less than the annual destruction. This means that the United States consume annually not only the legitimate growth or increment, but also a portion of their capital, a process which must inevitably lead to bankruptcy, if it is not stopped, at an early date. The seriousness of the position has, fortunately, been recognised, and efforts are being made to introduce more conservative lumbering, and to protect the forests against ravages by fire and grazing."

Referring to Canada he says that, of the 800,000,000 acres of land classed as forests there, only one-third, or 266,000,000 acres, on the testimony of the Chief Inspector of Timber and Forestry for Canada, can be considered as timber lands, the rest being covered with small growth of some use locally, but of little, if any, merchantable value. It further appears that though the area of timber lands and the proportion per head are so great, that no failing of future supplies should be possible, yet the Statistician of the Dominion, Mr. George Johnson, gives a far from encouraging account of the state of affairs. The principal item in the exports used to be white pine, but this has now fallen to one-fifth of the quantity exported 30 years ago, spruce having gradually replaced it. Enormous quantities are said to exist of this, but cutting has of late developed so rapidly that, as regards Ontario, it is stated, "Its increasing use for the manufacture of wood pulp threatens serious inroads upon this valuable tree." Comparing the prices per ton since 1870 Dr. Schlich points out that, taking white pine logs, as an example, the average rates were as follows:—

Period.	Average price per ton. (In shillings.)
1870 to 1879	32/
1880 to 1889	47/
1890 to 1899	61/

and though the increase on prices in other timbers was much less it is quite sufficient to show that the total quantity of timber exported is now less than it was 30 years ago. Canada has not been able to meet the increased demand in Europe, and it is regarded as very doubtful whether she will be able to do so in future, unless definite and immediate action be taken to systematically manage her forests. Broadly speaking, the Canadian forests may be divided commercially into two parts—the eastern, supplying chiefly the United States and Europe; and the western, which exports also to the United States and Asia, Australia, and other countries. Mr. Johnson says:—

"A large portion of the (eastern) forests has been devilled, which means that all good trees have been cut out by the lumber men for marketable timber. The careless torch has lighted fires like the Miramichi fire, which swept with fierce energy over an area of more than three million acres, leaving blackened giant pines to be a reminder for more than half a century of the immense destruction there and then caused."

The following statement is quoted as having been made by Mr. Edwards in the Canadian Parliament in 1893:—

"It is safe to say, and I am sure that every lumberman in this House will bear me out in that statement, that ten times more forest wealth has been destroyed in Canada through forest fires than has been cut by lumbermen."

The cuttings in 1893 were estimated to amount to 40,000,000 tons, the doctor informs us, and adds that if Mr. Edwards is right, the annual destruction would amount to 400,000,000 tons, or considerably more than the existing timber area produces. A disastrous state of things to contemplate! And though it seems that considerable attention has been aroused on the question the measures taken to cope with the evil by systematically managing the forests have been on altogether too feeble and insignificant a scale to deal with such vast areas.

Referring to the paper pulp industry, which in such a comparatively brief period has assumed such enormous dimensions, the estimates given by the doctor for the amounts used by exporting countries are as follows:—

	Tons.
Sweden uses now annually	1,000,000
Norway uses now annually	1,400,000
Finland uses now annually	200,000
Canada uses now annually (about)	1,200,000
United States uses now annually (about)	7,500,000
	11,300,000

He further states that the actual quantities of wood used for paper pulp manufacture in importing countries like Britain, France, and Belgium are included in the data given for those countries of timber imported, and as they were not classed separately the exact amount cannot be ascertained, but it is evident that the consumption in those countries would largely increase the total already given. In a paper on "Chemical Wood Pulp," by Mr. S. P. Eastick, given before the Imperial Institute in 1895, the basis taken for calculating the area of forest utilized by the annual consumption of 500,000,000 feet of timber for paper pulp at that time, was a yield of 5,000 feet per acre, which showed an annual clearance of timber from 100,000 acres per annum for the United States only. Taking the consumption indicated by Dr. Schlich's estimate of 7,500,000 tons, and allowing 400 feet per ton, we have 3,000,000,000 feet as the annual quantity up to 1901, which, on the basis of 5,000 feet per acre, gives 600,000 acres as the area of forest annually required by the United States for paper pulp alone! This amount seems at first sight staggering and improbable. but when it is remembered that the estimated requirement for only one New York paper for paper pulp is seven acres per day, or nearly 2,200 acres per year, and when the large number of populous cities in the States, with the inevitable number of "dailies" required over that vast territory, is also taken into account, the improbability vanishes at once, and the full weight of such an enormous strain on forest resources becomes alarmingly real. One especially objectionable feature in the exploitation of forest areas of paper pulp is that everything, from the sapling, with small diameter, to the tree as high as 41 inches in diameter, goes down before the faller's saw, leaving nothing to grow into a future forest for further supplies.

A startling proof of the rapidity with which the paper pulp industry can absorb forests in its all devouring maw, is found in the following extract from Pitman's Phonetic Journal, which appeared in The Advertiser on September 8, 1902:—A trial was recently made in Austria to decide in how short a space of time living trees could be converted into newspapers. At Elsenthal, at 7.35 in the morning three trees were sawn down, at 9.34 the wood, having been stripped of bark, cut up, and converted into pulp, became paper, and passed from the factory to the press, when the first printed and folded copy was issued at 10 o'clock, so that in 145 minutes the trees have become newspapers!

With such an illustration of the celerity with which timber can be converted into paper it is impossible to contemplate the amazing rapidity with which the demand for wood pulp has increased, without feeling that the assault thus hourly made upon the standing supplies of pine timber constitutes a very grave problem indeed, the importance of which is greatly accentuated by careful consideration of the numerous and weighty facts already advanced on the authority of Dr. Schlich, C.I.E., F.R.S., late Inspector-General of Forests, India, and Principal Professor of Forestry, Royal Indian Engineering College, Cooper's Hill, London.

The more such facts are pondered the more increasingly is it apparent that problems of this kind can only be dealt with satisfactorily by exploiting existing timber stocks on the soundest system of management, and by taking prompt and energetic steps whenever and wherever necessary to augment present naturally grown forests by creating artificial forest wealth on the lines now so well understood and so successful in their results where rightly carried out.

Even a casual glance at this subject must impress on every intelligent reader the fact that it behoves all countries needing pine timber to enquire promptly to what extent they can supplement "deal" or pine supplies from abroad by growing their own timber. South Australia is sending over £200,000 yearly out of this country for pine timber, and with the increased fruit production that may be safely reckoned on, the amount needed for fruit drying and transit will very largely increase. Can she grow any of this timber herself? If so, why does she not do it, and keep this money in the country, while at the same time materially assisting in solving the question of employment for idle hands by finding work in creating work in maintaining, and ultimately work in converting her artificially created forests into merchantable produce, for which the demand is ever on the increase.

It will be our province on a future occasion to furnish a reply to the first question, "Can South Australia grow any pine timber?" by a plain statement of what the Forest Department has been able to prove by forest culture, which, at first experimental, has passed from that stage to the practical, and can now produce facts that "winna ding and canna be disputed." It will be the duty of the people of South Australia to say whether they will develop a promising and highly valuable industry by entering on a spirited forest policy, or whether they will neglect "to take occasion by the hand," leave thousands of acres fit for timber growing and nothing else, in various districts, to lay idle and useless, and by-and-by pay the well-deserved penalty by having to give enormously enhanced values for their pine timber, even if procurable, within the next 25 years. It will be useless then to talk of hardwoods, for hardwoods cannot fill the place of soft woods, which form 85 per cent. of the world's timber consumption.

IRRIGATION ON THE MURRAY: UTILISATION OF THE SWAMP LANDS.

By Arthur J. Perkins, Secretary for Agriculture.

(Continued from page 494.)

The agriculture of to-day is no doubt still largely guided by the experience slowly accumulated by our forefathers. In many points, however, modern requirements have imposed radical changes upon traditional routine, and on all sides agriculturists may be seen more or less blindly following new practices, that they believe to be in harmony with the requirements of an altered environment, although of the faith that is in them they can give no satisfactory account. True, that to-day's truth is but too frequently to-morrow's error; but if human knowledge, even at its best, is but a groping after truth, and as such often leads its votaries astray, to what waste of time and energy must not be put those whom circumstances drive blindly in the footsteps of chance? In the routine that has been bequeathed us, we see the finished edifice; happily the struggles and failures that presided over its costly erection do not come within our ken. In our times, success depends mainly on economy of energy; waste spells failure to the individual and the State; and to-day that the stress of times has rendered necessary a certain amount of remodelling in our venerable legacy, let us see to it that our brick and mortar be of the best, and produced with the least amount of misdirected energy. I take it that knowledge, such as we possess it—a knowledge of the why and the wherefore of the practices we follow—must prove the surest guide to ultimate success. So much by way of apology, for introducing a somewhat arid discussion on the chemical features of the swamp soils. I may indulge the hope that it may, perhaps, prove of use to others than those immediately interested in the Murray banks.

We may note first that these swamp lands appear to be of considerable depth. In taking samples for me, Messrs. Morphett found the soil to remain similar in character two feet below the surface; beyond this depth they could not at the time go. The land had been recently irrigated, and the water level was within reach. Two feet of soil of this character will carry luxuriant crops for an almost indefinite period of time.

The samples were submitted to two distinct forms of analysis—first, a physical analysis—i.e., an analysis tending to show the mechancial and physical state of the soil. This analysis was kindly undertaken for me by Mr. W. R. Jamieson, B.Sc., of Roseworthy College. Second, a chemical analysis—i.e., an analysis showing the proportions of fertilising substances contained in the soil. This analysis was conducted by Mr. Chapman, of the School of Mines.

PHYSICAL ANALYSIS.

Mr. Jamieson reports complete absence of gravel or coarse vegetable debris, so that the swamp may be looked upon as entirely formed of fine soil. This is merely a natural consequence of its mode of formation. Situated not far from the mouth of the river, the lower flood waters bring with them only sedimentary matter in the finest state of division. Coarse gravel and heavier particles are deposited higher up, and go mostly towards raising the natural bed of the river. It may be noted here that in the general constitution of a soil, stones and gritty particles or gravel are by no means to be despised. They help to open out the soil, and to maintain it in a condition generally satisfactory to tillage operations. When, however, in spite of the absence of these coarser particles, the mechanical condition of the soil continues well adapted to ordinary tillage, as is certainly the case in the present instance, it may almost be said that the relative fertility of the soil is in direct ratio of the fineness of division of its component particles. This point hardly needs elaboration, for it is quite evident that in a soil, naturally both free and open, and at the same time in an extremely fine state of division for a same weight of soil, the contact surface offered to the roots is far in excess of what obtains in coarser gritty soil. Not unconnected therefore with the great fertility of these swamps must be the fineness of the particles of which they are composed.

The air-dried sample of fine soil, when further dried at 110 deg. C., was found to still retain 7.36 per cent. of moisture. The soil may therefore be looked upon as highly retentive of moisture, and as such well adapted to the growth of plants. The physical analysis of the soil demonstrates that this power to retain moisture is a direct consequence of the presence of a large amount of both fine colloidal clay and organic matter.

Mr. Jamieson has tested the mechanical state of the soil in two distinct ways, both of which are given below, with short explanatory notes.

TABLE I.

MECHANICAL ANALYSIS OF FINE SOIL DRIED AT 110° C.

Coarse sand (retaining 2.4 per cent. of organic matter)	8.1
Medium sand (retaining 2.9 per cent. of organic matter)	12.0
Fine sand (retaining 4.8 per cent. of organic matter)	24.2
Fine silt by difference (retaining 6.9 per cent. of organic matter)	38.7
Total organic matter	17.0
	100.0

TABLE II.

PHYSICO-CHEMICAL ANALYSIS OF FINE SOIL DRIED AT 110° C.

(SCHLŒSING'S METHOD).

Calcium oxide (lime)		0.8
Sand	associated with undecomposed	60.6
Colloidal clay	organic matter	36.4
Humus (humic acids)		2.[illegible]
		100.0

I have given the results as they have been worked out by Mr. Jamieson, and the points of importance to be noted may be summed up as follows: —The soil is exceedingly rich in the constituent known as colloidal clay, as evidenced in Tables I. and II. respectively by the figures for fine silt and colloidal clay. Added to this, the proportion of lime present is certainly small. Had not the soil been exceptionally rich in organic matter, this abundance of impalpable clay and relative lack of lime would undoubtedly have contributed towards rendering the soil exceedingly tenacious and intractable to tillage operations, either in the wet or dry state. Fortunately, 17 per cent. is a high proportion of organic matter for any soil; and so long as there is no appreciable lack of this substance, the swamp soil will continue to retain its naturally open and friable nature. It must not, however, be overlooked that reclamation and tillage operations have completely changed the conditions that in the past favoured this accumulation of organic matter. When Nature reigned supreme and unhindered, these swamp lands were covered with rank vegetation, that under the alternating influences of flood and drought flourished and died, leaving their remains as a contribution towards the steadily increasing stock of organic matter already present. Research work of the latter end of the nineteenth century has taught us that the decomposition or destruction of organic matter takes place mainly as a consequence of the vital energies of special ferments or bacteria. This process, which has received the name of nitrification, can only take place under certain conditions of aeration, heat, and moisture, that favour the growth of the micro-organisms. It is safe to conclude that in the past conditions favouring nitrification, and, consequently, the destruction of organic matter, have not obtained in the swamp lands. Surface tillage operations, however, must necessarily bring a disturbing element into play: for the formation of nitrates, so necessary to many of our crops, is a general consequence of good soil cultivation. On the other hand, with the exception, perhaps, of some leguminous crops, such as lucerne, the amount of organic matter destroyed and partly consumed by one crop will always be in excess of what is left in the ground in the form of roots, leaves, stems, &c. The tendency, therefore, under the new order of things will be towards a gradual reduction in the proportion of organic matter at present to be found in the soil. The present stock is undoubtedly enormous, represented to a depth of two feet by over 510 tons of organic matter to the acre; and, so far as the actual food requirements of plants are concerned, there is little fear of exhaustion for many generations to come. In a soil of this description, however, the importance of organic matter on its mechanical state cannot be overlooked, and any notable reduction in its relative quantities must tend to hamper tillage operations, and, consequently, to render less satisfactory the growth of crops. Such a contingency belongs, perhaps, only to the distant future; but it cannot come amiss to draw attention to it even at this early stage, and it is satisfactory to know that occasional dressings with lime will at any time restore to the hardened soil its one-time friability.

The present condition of the organic matter of these soils is worthy of passing reference; whereas, in its bulk it is represented by 17 per cent. of the soil dried at 110 deg. C., there is not more than 2.2 per cent. in the form of true humus or decomposed organic matter. It may be taken fo granted that in the course of time constant tillage will have the effect of slowly raising the proportion of humus at the expense of the at present undecomposed organic matter. A similar analysis of the same soil conducted in five or six years' time will not be without interest.

CHEMICAL ANALYSIS.

The questions of direct practical value that may be raised by the chemical analysis of a soil are numerous. A complete analysis—that is to say, an analysis accounting for all the substances present, is not without its own special interest. The issues involved, however, lean more to the academic than the immediately practical aspects of the subject. As a general rule, so far as the special food requirements of plants are concerned, there exists in most soils a superabundance of iron, alumina, silica, soda, magnesia, &c. Some of these substances may be looked upon as indispensable in the formation of vegetable tissues. Others probably owe their absorption by the roots to the fact that they are found in soluble form in the liquid containing the essential elements of plant food: others, again, merely form the bulk of the substratum to which, as is their nature, plants cling for support during lifetime. For inferences of practical value we are therefore at liberty to neglect these commoner substances, and for a complete analysis substitute a partial analysis, the object of which will be first to ascertain the proportions of those substances indispensable to vegetation, which, like gold in the quartz matrix, have been distributed over soils by Nature with a sparing hand; and, second, to ascertain the proportions of certain salts, which, if present in excess, interfere with healthy plant growth.

To the uninitiated, it is to be feared, an analysis is little more than a string of names and figures. In the present instance I am anxious that to those who have the patience to follow me, it should represent something more concrete, more living; and I cannot, therefore, avoid a digression, which may, after all, not be without its own special interest. Soils, it has already been hinted, are extremely complex in their composition. Of their many components, however, three alone stand out as pre-eminently indicative of soil fertility. They are respectively known as nitrogen, phosphoric acid, and potassium oxide or potash. Nor in most cases is it wise to overlook a fourth component, usually present in far greater proportions than either of the latter. I refer to calcium oxide or lime. The proportion of lime in a soil is of many-sided interest. It largely determines the mechanical state of the soil; it affects the availability to plants of other soil components; it is itself in most cases essential to plant development; and it frequently exercises a determining influence on the types of manure to be used.

To judge of the value of a soil by its analysis, it is essential to have some standard of comparison. Local analyses are far too few in number to enable us to establish one from local statistics; and until we can secure the appointment of an agricultural chemist to carry out exclusively analyses of agricultural interest, they will continue to be so. We are forced, therefore, to fall back upon European data: and, be it said in passing, I am of opinion that time will show, whatever may at present be said to the contrary, that these data are equally applicable here; or, in other words, that a poor soil remains a poor soil all the world over, however much climatic influences may modify the average yields of different countries.

With the following proportions expressed in relation to the fine soil dried at 110 deg. C., a soil may generally be described as of good quality, and looked upon as capable of carrying good average yields without the artificial stimulus of manures:—

Nitrogen, 1 part by weight in 1,000
Phosphoric acid, 1 part by weight in 1,000
Potassium oxide, 2 parts by weight in 1,000
Calcium oxide, 50 parts by weight in 1,000.

Soils containing lesser amounts of any one of these substances may generally be looked upon as poor in these special lines; whilst an appreciable excess stamps them as rich, or even exceedingly rich.

Now what, on the whole, do these figures represent in the concrete? This is a question which I shall now endeavour to put in as clear a light as possible. If we admit, somewhat arbitrarily, it is true, that plants draw their nourishment mainly from the first foot of soil, we may represent the average weight of soil at their disposal over one acre by 3,250,000 lb. One acre therefore, of our standard good soil should contain in the first foot:—

Nitrogen, 1 in 1,000—3,250 lb.
Phosphoric acid, 1 in 1,000—3,250 lb.
Potassium oxide, 2 in 1,000—7,500 lb.
Lime, 50 in 1,000—16,250 lb.

I have no illusions as to the absolute value of these figures. They are but the present expression of that groping after truth that we call knowledge. Much, no doubt, depends on the state of availability of these various substances; but to what extent, and in what manner, our somewhat limited information on the matter does not permit us at present to definitely state.

To some the fact that a soil containing 0.25 in 1,000 of phosphoric acid, representing about 812 lb. to the acre one foot deep—and this constitutes an average common to many South Australian soils that have been analysed—that such a soil should still be described as poor, may, perhaps, appear somewhat difficult to reconcile to their unaided reasoning powers. Nevertheless, our limited local experience goes far to prove that without phosphatic dressings such soils will not yield satisfactory cereal crops; and that, further, in the course of time, a succession of yearly dressings vastly improves their carrying capacity for grasses and natural herbage. The explanation of this apparent anomaly may, perhaps, be made clearer by an appropriate simile. Looking for a needle in a haystack may well represent the task of the roots in a soil almost completely devoid of phosphoric acid; whilst in a soil only relatively poor it might be compared to fowls picking out stray grains from a haystack, as compared to others who had gained access to the unwinnowed heap of cocky chaff and grain. Let us remember in this connection that under a hot dry climate those annuals alone succeed that are able to reach maturity before the soil has lost the essential moisture; that in a poor soil, as in a dry soil, the relative proportion of root to stem and leaves is always in excess of that that obtains in a rich soil or a moist soil. It follows that time that might otherwise have been utilized in building up tissues above ground is more or less wasted in developing a powerful root system, that has to hunt far and wide for its available food, and frequently the dry weather surprises the plants at too early a stage in their development, and the result is naturally disastrous to the cultivator. That is the position of the poor soil, as I understand it, expressed as clearly as I am able to do it.

Finally, I must point out that in working out the weights of fertilising substances per acre I have taken into account solely the fine soil, as none other was present in the swamp land. For a coarser soil manifestly this would be incorrect. Take the extreme case of a soil consisting of one half stones and grit, and the other half of fine soil. The amount of phosphoric acid to the acre would only be equal to one-half of what it would have been had it contained nothing but fine soil.

In our May issue I hope to take up the chemical analysis of the swamp soil itself. I trust I will be excused this somewhat long digression. In the interests of clearness I have judged it necessary.

Since writing the above my attention has been drawn by Mr. H. W. Morphett, to two erroneous statements inserted in my first article on this subject. I stated therein that the 7 ft. embankment was of sufficient height to keep out a flood equal in volume to the one that visited the district in 1870; I am now informed that whilst the embankment would certainly have kept out the 1890 flood, it is morally certain that it would have been powerless before the 1870 flood. It may be remarked that such floods are fortunately of very rare occurrence. Under a further misapprehension, I also stated that Messrs. Morphett & Co. had found the earth from which the embankment was built too porous to prevent infiltration from the river, and that in consequence they had been compelled to coat it with swamp silt. I am now informed that this is not the case, and that in fact the embankment held like a bottle. The coating of silt applied on the river side of the embankment is destined to check erosion from waves and movements of the water. For this purpose couch grass or some other plant would probably offer better protection.

(To be continued.)

POT EXPERIMENTS TO DETERMINE THE LIMITS OF ENDURANCE OF DIFFERENT FARM CROPS FOR CERTAIN INJURIOUS SUBSTANCES.

Under the above heading Messrs. F. B. Guthrie and R. Helms read a paper before the Royal Society of New South Wales in October, 1902. The following notes are collected from a reprint concerning wheat, published in the February number of the Agricultural Gazette of New South Wales:—

In respect to common salt (sodium chloride) their conclusions are summarised as follows:—"0.01 to 0.02 per cent. of common salt is without effect upon the wheat plant, the grain germinating well and the plants growing vigorously. With 0.05 to 0.1 per cent. the germination is somewhat retarded; the plants are less vigorous, but recover and grow well. With 0.15 the germination is still more affected, and the plants would probably not recover under less favourable conditions than those of the experiment. 0.20 per cent. of common salt in the soil is fatal to the growth of wheat."

If we transcribe these results in terms more likely to appeal to the grower, on the assumption that one acre 1 ft. deep weighs 3,250,000 lb., we are led to the following conclusions:—

(1) 325 lb. to 650 lb. of common salt per acre are without ill-effect upon wheat.

(2) 1,625 to 3,250 lb. per acre retards germination and growth, although the plants subsequently recovered under the conditions of the experiment.

(3) 4,875 lb. per acre hinder germination to a greater extent, and it is surmised that under less favourable conditions the plants would have perished.

(4) 6,500 lb. per acre are fatal to the growth of wheat.

SODIUM CARBONATE.

The authors also tested the action of sodium carbonate on wheat. In respect to this salt they state:—

"Sodium carbonate is present in the water of many of the artesian bores in New South Wales. As these waters constitute in many cases the only available supply for irrigating, the question of the limit of tolerance of different crops for this alkali is one of considerable importance. When water charged with alkali is used for irrigating the soil frequently becomes covered with a white crust, consisting of sodium carbonate. This is due to capillary action which brings the alkali to the surface, where it is left as a deposit on evaporation of the water. When the amount of alkali present is considerable, the soil becomes quite hard, and tillage operations are rendered very difficult, and in some cases impossible. These conditions were not reproduced in the experiments, the surface of the pots being covered by a mulch, so that surface evaporation was reduced to a minimum, the soil was always moist, and the drainage effectively prevented the accumulation of water or of water charged with alkali. The experiments, therefore, represent the action of the alkali upon the plant itself, without reference to its possible deleterious effects upon the soil."

Conclusions on the experiments are summarized as follows:—"Quantities of sodium carbonate (Na_2 Co_3) up to 0.20 per cent. of the soil do not affect the growth of wheat in any way. With 0.30 per cent. germination is affected, with 0.40 per cent. germination is much affected and the plants die; 0.30 per cent. can therefore be regarded as the limit of endurance."

Referring these figures to pounds per acre, as has already been done for common salt, we obtain the following results:—

(1) 6,500 lb. per acre of sodium carbonate are without ill-effects upon either the germination or growth of wheat.

(2) 9,750 lb. per acre of sodium carbonate retard germination and affect growth.

(3) 13,000 lb. per acre of sodium carbonate are fatal to wheat.

The authors then go on to examine the action of ammonium sulphocyanide (occasionally found in sulphate of ammonia), of sodium chlorate (occasionally found in nitrate of soda), and of arsenious acid (occasionally found in superphosphates and other compounds in which sulphuric acid has been used). None of these substances present very much practical interest, and therefore I make no reference to them. It is to be regretted that they did not extend their experiments to magnesium sulphate, sodium sulphate, and magnesium chloride, all of which are frequently found in water, and even in certain soils: possibly they are not of general occurrence in New South Wales.

The authors point out very correctly that the results of the experiments only apply to conditions similar to those under which they worked. With them the injurious salts were distributed uniformly throughout the soil, whereas in actual practice the application of impure manures, or even simply the action of soil capillarity, may frequently accumulate the injurious substances in upper layers of the soil, much to the detriment of germination and even of growth. They might have added that the constant removal of drainage waters from the pots would tend to remove a certain amount of the injurious salts, particularly in the case of so soluble a salt as sodium chloride, a condition that does not necessarily prevail in actual practice. It is to be hoped that The Agricultural Gazette of New South Wales will continue the publication of this valuable series of experiments.

EXPERIMENTS WITH FERTILISERS AND WITH RUST-RESISTING WHEATS.

By W. L Summers, Inspector of Fertilisers.

In February Journal I gave the results of most of the experiments carried out on behalf of the Department of Agriculture by members of the Agricultural Bureau. The following reports complete the season's work:—

EXPERIMENTS WITH FERTILISERS.

MALLALA.

I regret to state that since publishing the report on experiments at Mallala, I learn that Messrs. Churches omitted to fulfil their undertaking to harvest and weigh the results of each plot separately. The returns supplied by them were merely estimates; and as crops of 15 bushels to 20 bushels are rarely estimated with any degree of accuracy, these figures must be regarded as valueless. This is the more to be regretted, as several of the plots carried exceedingly good crops.

ELLISTON—MR W. J. PACKER

Land a sandy loam, ploughed early, and very loose and dry at seeding. Owing to drift fallowing is not practised. Seed was put in on May 5, Marshall's No. 3 wheat being sown. The season turned out one of the worst experienced on the west coast; up to June the soil did not get a good soaking. A long spell of easterly winds followed the June rain, and helped to dry up the moisture. The crop was harvested on December 20, and the total rain from 1st May to 31st November was under 10 inches. The character of the rainfall, rather than the actual quantity that fell during the year, was the main factor in the small yields. Mr. Packer states that in one of the best years experienced on the west coast the rainfall record was no higher than last year, but most of it fell during the winter months and in good soaking showers. Last year, with the exception of the June rains, the falls were comparatively light, and were followed by drying winds, while added to this was the fact that the previous season, having also been very dry, there was no reserve of moisture in the soil.

Manure per acre.	Yield per acre.		Weight per bushel.	Cost of Manure per acre.		Increased Yield per acre due to Manure.		Profit per acre over unmanured plot.	
	bus.	lbs.	lbs.	s.	d.	bus.	lbs.	s.	d.
40 lbs. Concentrated Super ...	8	0	60½	4	3	6	30	28	3
84 lbs. Bone Super ...	3	36	63	4	0	2	6	6	6
84 lbs. Guano Super ...	6	24	62½	3	0	4	54	21	8
84 lbs. Bone Super and Mineral Super	5	36	63½	3	6	4	6	17	0
84 lbs. Mineral Super ...	4	48	63½	3	3	3	18	13	3
112 lbs. Mineral Super ...	6	24	63½	4	4	4	54	20	4
140 lbs. Mineral Super ...	7	20	61½	5	5	5	50	23	9
No Manure	1	30	—	—		—		—	

Mr. Packer states that the "no manure" plot is the average of 100 acres; another 100 acres in the same field which was manured with 80 lb. mineral super per acre averaged 5 bushels per acre. Plots receiving concentrated super and 140 lb. mineral super suffered most from hot winds, hence the light weight grain.

While these results show generally the superiority of water soluble phosphate as compared with the citrate soluble, they are too irregular to permit of much in the way of comparison. It will be noticed, however, that the concentrated super has given the best result, and that the heavier the dressing of mineral super the more profitable was the result.

RUST-RESISTING WHEATS.

Scales Bay—Mr. J. J. Roberts.

Land fallowed in early part of September, 1901, and cultivated once prior to drilling. Seed sown on May 17, land being very dry. Only light rains were experienced during the season, and from end of June to September 10 the weather was unusually dry. Good rains fell in September and almost up to harvesting. No rust was visible on any of the wheats. The yields per acre were as follows:—Allora Spring, 14 bush. 24 lb.; Smart's Early, 13 bush. 18 lb.; Budd's Rustresistant, 13 bush. 6 lb.; Bartlett's Crossbred, 10 bush. 8 lb.; Petatz Surprise, 9 bush. 12 lb.; Wiltunga Wonder, 8 bush. 14 lb.; Gluyas Early, 7 bush. 46 lb.

Comparing these returns with those given on page 454 of February Journal it will be seen that Smart's Early wheat has again done well, as also has Budd's Rustresistant. Alongside the test plots Mr. Roberts sowed Marshall's No. 3, which yielded 16 bush. 50 lb., and Rattling Jack, which gave 10 bush. 34 lb. per acre. The satisfactory results from Marshall's No. 3 and Allora Spring are probably due in a large measure to the later rains proving more abundant than usual; in the dryer localities the former, at any rate, does not ripen early enough.

TWENTY-ACRE WHEAT CONTEST, SADDLEWORTH.

During the past season the Saddleworth Agricultural Bureau, as the result of offers of prizes from various firms, arranged for a 20-acre wheat contest. The Adelaide Chemical Works Company offered gold and silver medals for best and next best crops manured with fertilisers sold by them. Messrs. Clutterbuck Brothers offered two prizes of £5 5/ each on behalf of the Massey-Harris Co. for (a) best crop put in with a Massey-Harris drill, and (b) best crop put in and taken off with Massey-Harris implements. Messrs. George Wills & Co. offered £5 5/ for best crop manured with United Alkali Co.'s superphosphate. The Bureau offered two prizes each of £1 1/ for the best all-round crops.

The rainfall recorded at Saddleworth during the year was as under:—

January	0.38 in.	July	1.56 in.
February	0.64 in.	August	1.24 in.
March	1.63 in.	September	1.26 in.
April	0.38 in.	October	2.78 in.
May	0.90 in.	November	0.38 in.
June	3.33 in.	December	4.31 in.

Total for year, 18.79 in.; from April 1 to October 31, 11.35 in. The December storm did more harm than good to the crops, knocking out some grain and bleaching the wheat. The season, on the whole, was a very good one. The small number of entries is partly due to crops being cut for hay in such a way as to make it difficult to tell what the actual yield was, probably better crops than those entered were reaped in the district.

The contest was intended to be educational, and with that idea in view, a series of questions was required to be answered by each competitor. A study of the replies is of some interest, and gives a fairly good idea of the method of wheatgrowing in this part of South Australia, though, as the judge in the contest reports, "the information gained is not of the value that it ought to have been."

All the seed was pickled with bluestone; most of the competitors using 8 oz. to the bag of seed, but two used only 4 oz. to the bag. With two exceptions, the manures used were manufactured by the Adelaide Chemical Works Co. In all cases the seed was sown within a week of being pickled; in most cases the day after pickling.

ANALYSES OF FERTILISERS.

By W. L. Summers, Inspector of Fertilisers.

The following tables give the results of the analyses of various samples of fertilisers obtained by myself during the current season, together with the registered guarantee of the vendor:—

Mineral Superphosphates.

Vendor.	Brand of Fertiliser.	Water soluble Phosphate.	
		Guarantee.	Official Analyses.
		Per cent.	Per cent.
Geo. Wills & Co.	United Alkali Co.	36	37·7, 37·3, 36·6
Clutterbuck Bros.	United Alkali Co.	36	37·7, 37·3, 36·6
Clutterbuck Bros. .. .	Packard's ...	36	39·2, 39 3, 39·3
Gibbs, Bright, & Co.	Ohlendorff's ...	36	37·5
S.A. Farmers' Co-operative Union	Ohlendorff's ..	36	37·1
S.A. Farmers' Co-operative Union	United Alkali Co.	36	37·7, 37·3, 36·9, 36·6
Elder, Smith, & Co.	Lawes'	36	38·2, 38·7, 37·1
Wallaroo Phosphate Co	Wallaroo ...	36	36·8
Australasian Implement Co. ...	Shirley's ...	36	36·0
Australasian Implement Co. ...	United Alkali Co.	36	38·9
Norman & Co.	Reliance ...	36	38 3
D. & J. Fowler...	Eagle	29	29·9
D. & J. Fowler...	Lion No. 2 .	36	37·8, 37·3
D. & J. Fowler...	Green Lion ..	39	41·9, 43·0
D. & J. Fowler...	Rising Sun ...	39	42·3
D. & J. Fowler...	Tortoise .	36	38·4
D. & J. Fowler...	Stork	36	38·3
Adelaide Chemical Works ..	Mineral Super ...	36	41·5, 41·3, 39·6

General.

In this table the guarantee is shown in brackets after the official analysis.

Vendor.	Brand.	Official Analyses.
Norman & Co. ...	Scotia Thomas phosphate	Acid soluble phosphate, 29·5% (30%)
Norman & Co. ...	Reliance phosphate . .	Citrate soluble phosphate, 19·9%, 20·1% (20%)
Aust. Implement Co.	Swan Thomas phosphate	Acid soluble phosphate, 28·8%, (30·5%)
Crompton & Son ..	Bonedust	Nitrogen, 3·26% (3·9) ; Acid soluble phosphate, 46·6% (44·67)
Conrad, L.	Bonedust	Nitrogen, 4·35% (3·6) ; Acid soluble phosphate, 41·5% (43·6)
Adelaide Chem. Works	Bonedust	Nitrogen, 3·4%, 3·71% (3·5) ; Acid soluble phosphate, 45·8%, 47·9% (45)
Adelaide Chem. Works	Bone super	Nitrogen, 1·45% (2·1); water soluble phosphate, 17·7%, 19·9% (15·2) ; citrate soluble phosphate, 13·3%, 11·7% (15·8) ; acid soluble phosphate, 9·7% (6)
Adelaide Chem. Works	Guano super	Water soluble phosphate, 27·9%, 25·7%, 31·2%, 25·4% (20·2); citrate soluble phosphate, 4·2%, 2 6%, 2·6%, 3% (10)
Adelaide Chem. Works	Wheat manure	Nitrogen, 1·16% (1·05); water soluble phosphate, 28·4% (28·1) ; citrate soluble phosphate, 5·2% (5·9%) ; acid soluble phosphate, 9·8% (6)
Adelaide Chem. Works	Super B	Water soluble phosphate, 32·9% (15); citrate soluble phosphate, 2·6% (15)

FARM HINTS FOR APRIL.

By A. Molineux

On February 14 this present year a well-known farmer was seeking hands to help him cart in several acres of barley which he had reaped and bound during December, 1902, and on February 25, this year, another farmer was engaged in carting in and stacking hay that had been cut early in December previous. Both instances occurred not very far from Adelaide, and both barley and hay were very considerably deteriorated in value by the rain. This was a strong hint not to trust to Providence to delay the rain until you have energy enough to secure the reward of former diligence in preparing the land and sowing the seed.

Sand lucerne (Medicago media) is hardier than common lucerne (Medicago sativa), and will grow on drier soil. It would probably grow in the north, where the common lucerne would fail: at any rate, it will do well on sandy land. Where night frosts are not early or severe the best time to sow lucerne is at the end of autumn, but in frost-liable places it would be better to wait until beginning of October. The soil should be deep and thoroughly pulverized, then worked down as smooth and fine as for an onion bed. Next sow the seed at the rate of 12 to 16 ℔. per acre. Singleton seed, grown near Sydney, appears to be the best. Drill it in if possible, half an inch deep, and in rows a foot apart. Roll the seed bed at once, and when the plants are three inches high go over the field with a light pair of harrows to loosen up the surface and let the air in. Mow when the plants are in flower, but do not put any stock to graze upon the plants, unless it is desired to kill the crop. Lucerne should be cut and left on the field for half a day before being fed to milking cows, else the milk will have a curious smell and taste, which will also affect the butter. Bonedust and kainit are good manures for lucerne, and it will grow on somewhat brackish land.

Those farmers who adopted the advice given about sowing mustard and rape seed on fallow land or on harrowed stubbles will now reap the benefit of their enterprise in the shape of a good crop of early green feed for their live stock. Three pounds of each kind of seed is ample for an acre, and it is not too late, even now, to try for an acre or two of the same stuff. Some captious chaps have asked me what could a farmer do with all the feed he would grow on his fallows and stubbles if he were to do what I advise; but my advice has always been to sow a few acres only, and not the whole of his land. If each farmer would study economy we would see green crops grown every year, cut and carried to the sheds or yards, and fed to the animals, instead of being half destroyed and wholly defiled by grazing the crops on the fields.

Will the effect of a wet season be the development of red rust? I think it will, and therefore strongly urge every farmer to secure and sow as much rust-resistant wheat as possible. The fact that one variety of wheat will be rotten with red rust whilst another sort grown alongside will be perfectly free should appeal to the commonsense of every one; especially when the rust free variety yields as heavily and gives a grain as plump and quite as valuable for milling purposes as that from the rust-liable sort.

Sow grass seeds on well-prepared land; also clovers, and all other hardy plants that will withstand light night frosts. Broadleaf mustard, French honeysuckle (sulla, or Malta clover), sainfoin, goats' rue, burnet, and a dozen or two of other plants will do well and produce rich and healthy fodder for live stock. Rape should be sown at the rate of 3 or 4 ℔. per acre, and if the land can be heavily manured there will be greater surety of a heavy crop, although I have known of big crops being raised on land, without an ounce of manure, that had been "worked out" with successive crops of wheat and hay. Sow in drills 18 in. apart and 1 in. deep. Roll at once, and harrow when the plants are 3 in. high. This crop may be fed off by sheep, and will give a second crop if the animals are not left on too long. An ensilage crop ought also to be put in. A mixture of oats, rape, mustard, vetches, tares, peas—any two or more—will make better silage than one single article alone.

Horses that are working must have nourishing food to maintain their strength and condition. Hay alone is not good enough for them, because the animal would have to keep feeding all night, when it should rest. The horse has a comparatively small stomach, and there is not very much nourishment in dry hay; therefore, crushed corn of some kind should be given, or beans, or equally rich food.

Every alien plant among a crop takes the place of a useful one, and robs the adjacent plants. When there are many weeds amongst a crop it is the farmer's fault that the crop is poor. The land must be cleaned, but there is no real necessity that it should remain idle, or fallow. Apply as much farmyard manure as can be spared, and grow a crop for the silo; follow that with some peas, maize, sorghum, beets, or mangolds, or anything that requires the hoe to produce best results, and the land will be cleaned, enriched, and fit to grow cereals or anything else. The silver beet is well worth trial as a green fodder, and buckwheat ought to be tried on sandy or stony land; it matures from seed within 90 days, but is subject to frost. Peas should be sown to cleanse dirty land and for feeding the animals.

Before the land gets soddened with rain, cart out and spread all the manure. New manure can be carted on to dirty land intended to be used for raising a crop for the silo, and will be worth twice as much as old stuff that has had all the virtue leached and sweated out of it in the pit or dung heap.

Cattle cabbage, kail, kohlrabi, swedes, and similar plants should be grown in straight rows, between which the horsehoe can be frequently used. Liquid manure and the hoe will ensure heavy crops from these plants.

It pays well to keep the cows warm at night by rugging them; it saves food and maintains good health in horses and all other stock to protect them against cold; it causes damage and loss to neglect shelter for the dead stock of the farm, such as implements, tools, machinery, wagons, and the like. Very few farmers neglect the new buggy, but some leave everything else to the influence of wind, wet, and weather.

There is nothing that I know of that is cheaper or more effective as a deodorant of stables, styes, closets, and all evil-smelling articles, than gypsum. It acts more quickly when burned to powder. It kills the bad odour at once, and locks up the ammonia, so that the manure is more valuable. It is strange that this cheap substance is not regularly used at railway stations hotels, and generally everywhere else.

Two ounces of bluestone to the gallon of water is the right pickle for seed wheat. When more pickle is wanted mix it at that rate, and do not chuck in bluestone and water by guess. If the seed appears to be quite clean a little less bluestone will do, but all seed wheat should be pickled and kept a day or two before sowing.

Separate the boars from the sows for a few weeks. Winter litters are seldom healthy or profitable, and the boars and sows will benefit from a rest.

ROSEWORTHY AGRICULTURAL COLLEGE NOTES.

FARM.

During the past month three seedings of rape have been made. The first (on February 24) is now up, and growing rapidly. It promises good feed for the ewes at lambing time. The sorghum has been fed off once, but with the stock out now a good second growth is promised. The recent showers have given good feed in all the fields. Since the sorghum was finished, however, the milch cows have been receiving ensilage.

Several students are working at the College during the present vacation. Mr. Williams is putting in the waterpipes for all of the outside reticulation, including that of the College vegetable garden which the Hon. the Minister of Agriculture has recently requested Mr. Quinn to manage. The farm department and vineyard are pushing forth the cultivation of fallows and vines with all possible dispatch, the students doing the greater part of the work.

The wheat experiments for next season will consist in continuance of variety tests, trials of such new wheats as we may be able to secure, and some fertiliser tests, aiming to study the needs of the soil.

We have added to the list of tools a Triumph 10-furrow plough, and it is doing most excellent work as a scarifier on the fallows. The arrangement of the shears is such that it takes the complete surface, thereby destroying every weed, and leaving a well-pulverized mulch of even depth on the surface. The draught is lighter than a scarifier doing the same work.

EXPERIMENTAL VINEYARD.

By H. E. Laffer, Superintendent of Vineyard.

The College vintage for 1903 is now a thing of the past. A start was made on February 24, the whole work occupying close on a fortnight. The yield was not so good as was anticipated, this being accounted for, I think by the dryness of the earlier part of the season. The summer rains filled out the berries fairly well, but could not make up for the poor setting of fruit and check received during the dry spell of weather. This illustrates the necessity of good winter rains, so that the vines will have sufficient moisture to enable them to thrive right from the time when the buds burst. In all, about 3,000 gallons of wine were made, principally full-bodied. The fruit was left rather later than usual, to enable us to make the wines fuller than in previous years. The crop was considerably diminished by birds and other pests. The starlings especially were very numerous, and removed a great quantity of fruit. Fortunately, the hail, which did considerable damage in some districts, was not noticeable at the College.

Vintage weather, excepting two or three days, was all that could be desired: but at the same time we were enabled to thoroughly test the efficacy of the wine cooler on those bad days. A new column of tubes was built by Messrs. A. Simpson & Son, much larger than the old set. The fan was driven from the engine, and the spray worked direct from the pipe with the Barossa water. The whole arrangement worked very well, and we found that wine passing once through the coil was reduced 5 per cent. C. Not only was it beneficial in cooling the "must," but the reduction of the cellar temperature was very considerable. On one day, with the shade temperature at 105 deg., and the building all open, the thermometer was kept at 78 deg. all day.

The manure test plots carried a small crop this season. These plots being rather irregular as to the number of vines in bearing, the only way to procure sufficiently accurate results was to count the number of vines bearing in each plot. The yields of course are very light so far, and can scarcely yet be taken as an indication of the efficacy of the various manures used.

Plot 1. Sulph. of am., sulph. potash, super. 2 cwt. each, yield 4 cwt. 3 qrs. 17 ℔.

Plot 2. Sulph. am. 3 cwt., yield 5 cwt. 1 qr. 16 ℔.

Plot 3. Super 3 cwt., yield 4 cwt. 1 qr. 25 ℔.

Plot 4. Sulph. potash 3 cwt., yield 5 cwt. 1 qr. 25 ℔.

Plot 5. No manure, 4 cwt. 0 qr. 25 ℔.

Plot 6. Gypsum 10 cwt., yield 3 cwt. 2 qr. 13 ℔.

Plot 7. Sulph. am. 2 cwt., gypsum 4 cwt., yield 3 cwt. 0 qr. 18 ℔.

These plots are each half an acre in extent.

VINE AND WINE NOTES.

By Arthur J. Perkins, Secretary for Agriculture.

In our January issue I indicated what had been the exports of South Australian wines to the end of the third quarter of 1902. Through the courtesy of the State Collector of Customs I am now in a position to complete the figures for the whole year. A glance at Table I., inserted below, will show that the position of affairs is exceedingly satisfactory. The total exports for the year, 845,418 gallons, are considerably in excess of our previous record, namely, those for 1901, which amounted to 595,853 gallons. Since the removal of the border duties the progress of the interstate trade, as was anticipated, has been remarkable. During the five years that preceded the advent of federation interstate exports averaged 48,125 per annum, whilst in 1901 they reached 110,182, and in 1902 157,300 gallons. Nor do the last quarter's returns show any decline in the general progress, for had the exports been at the same rate during the earlier quarters the total exports for the year would have attained 222,400 gallons. Before the Congress of the Agricultural Bureau, held in September last, I ventured to predict that the interstate trade would soon overtake the London trade. I am under the impression that the trend of events will soon justify my prediction. There is little doubt that in the past London merchants have not scrupled to take the utmost advantage of our somewhat congested markets. The time is fast approaching when positions will be reversed, and then the fate of the London trade will hang in the balance. Let us trust that London buyers will see the wisdom of adopting more conciliatory tactics, ere it is too late.

Table I.

Comparison of Exports of South Australian Wines during 1901 and 1902 with average of five years immediately preceding removal of Interstate duties.

Country.	1902.	1901.	Average of 5 years, 1896-1900.	Country.	1902.	1901.	Average of 5 years, 1896-1900.
	Galls.	Galls.	Galls		Galls.	Galls.	Galls.
New South Wales	66.927	45,317	5,722	United Kingdom	650,795	444,630	392,354
Victoria	28,002	10,164	11,066	New Zealand ...	26,955	33,473	28,246
Queensland ...	29,273	18,742	5,592				
Western Australia	22,328	19,041	21,277	British Burmah, India, Ceylon ...	8,383	6,256	—
Tasmania . ..	9,378	14,422	2.400				
Northern Territ'ry	1,392	2,496	2,068	Fiji, Straits Settlements, Java ...	390	460	—
				France, Belgium	748	—	—
Commonwealth ..	157,300	110,182	48,125	Germany... ...	719	852	—
	688,118	485,671	430,308	Other countries ...	128	—	9,708
Total exports ...	845,418	595,853	478,433		688,118	485,671	430,308

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I cannot help here adverting to a somewhat amusing letter appearing in the February number of The Australian Vigneron, from the pen of Mr. L. Frere. This gentleman, who appears to think that it is his special mission to contradict every statement of mine in respect to the wine trade, has but the vaguest idea of the economic aspect of the question. He takes offence at any discussion of the prospects of our interstate trade, because presumably his own particular interests in New South Wales are likely to suffer thereby. He questions the accuracy of my figures, and vehemently, if unconvincingly, denies the correctness of my conclusions in respect to the future expansion of the South Australian trade. A simple inspection of official records would easily have shown him that my figures are correct to the last unit; and as for my predictions, the least that can be said of them is that, at all events, returns for 1901 and 1902 have by no means contradicted them. To mistake an impartial examination of the economic position of vinegrowing in the Commonwealth for an attempt to depreciate the position of Victorian and New South Wales growers, is exceedingly foolish; and it were, perhaps, as well to warn Mr. Frere against the practice of measuring other people's corn with his own bushel.

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We must at all times look to distillation as a simple means of relief from temporary gluts; further, South Australian brandies are slowly but surely making their way on various markets: an examination of our exports of spirits is not, therefore, without interest. In Table II. are shown the progress of exports in wine spirits and brandies during the past three years. Any comment on my part would be superfluous; the figures speak for themselves.

Table II.

Exports of South Australian Wine Spirits and Brandies during the years 1902, 1901, and 1900.

Country.	1902.	1901.	1900.	Country.	1902.	1901.	1900.
	Galls.	Galls.	Galls.		Galls.	Galls.	Galls.
New South Wales ..	13,911	2,558	424	United Kingdom .	1,186	673	775
Victoria ...	4,826	46	112	New Zealand	1,810	843	935
Queensland . ..	1,034	351	262	Cape Colony, Natal	26	—	164
Western Australia ..	2,510	522	83	India, Ceylon .	—	—	130
Tasmania . .	361	99	53	Straits Settlement	50	—	—
Northern Territory .	5	18	66				
					3,072	1,516	2,004
Commonwealth	22,647	3,594	1,000				
	3,072	1,516	2,004				
Total exports ..	25,719	5,110	3,004				

GREEN MANURING OF ORCHARDS.

By J. D. Towar, Professor of Agriculture.

This question being one of general interest to orchadists I have asked the editor to publish in The Journal a letter received from Mr. W. Sage, of Angaston, and my reply thereto:—

"Mr. Sage states that of 16 acres of orchard which he proposed to manure this year, 10 or 11 acres consisted of very stiff soil, which sets hard after rain With a view to improving the physical condition, and adding to the fertility of the land, he had in view to sow peas and plough them under, applying also phosphatic manures at the rate of about 4 cwt. per acre. He wished to know whether it would in any way serve the desired purpose to encourage the natural growth of weeds, and plough them under instead of peas, as the cost of seed of the latter would be 15/ to 18/ per acre; also should the manure be drilled in with the peas, when should they be sown, and at what stage of growth should the crop be ploughed under. While admitting the force of the financial aspect of the question, Mr. Sage is satisfied that the treatment which will enrich the soil the most, and make it porous will in the long run be the cheapest."

From the description given above the first thought is that the land is such as is greatly benefited with under drains, and while these might prove beneficial, it is probable that there is not sufficient rainfall to warrant the expenditure. Perhaps, the best plan is in line with the one proposed by Mr Sage. We will naturally expect better results from peas than from the natural growth of weeds. In the first place, peas, being leguminous plants, draw largely for their support on the atmospheric nitrogen thereby, as a green manure, adding an element which the weeds and other crops not leguminous would not furnish. In growing peas or any crop from the cultivated seeds we get a crop uniform in character, date of maturity, and general distribution over the ground. While, if a mixed growth of weeds is ploughed under some of the plants will become fully matured and very slow to decay, many obnoxious weed seeds will again be sown in the field, and the actual manurial value of the crop is likely to be far less. It is true that an expense of 15/ to 16/ per acre for seed argues forcibly against the use of the peas, and it is possible to substitute some other legume costing less, such as crimson clover or vetch, or a mixture of all. Another means of economizing the seed would be to sow peas and barley, or oats. A mixture of crops for green manure is always desirable, since if one fails the other may make a good growth. Whatever is done I would surely see that some leguminous crop such as the peas, beans, vetches, lupins, lucernes, or clovers is sown, and given a good chance to grow.

The time and method of sowing the phosphate is still somewhat undecided. At present I would consider, first of all, the economic view of the operation, and apply it when it can be done most cheaply and conveniently, though not over four weeks before seeding. Mr. Sage knows when to sow peas and secure the rankest growth much better than any one not living in his immediate neighbourhood. The object is to have a good rank growth, not ripe, nor even beginning to ripen, at the time we wish to plough them under. would push the growth along, so as to get the peas ploughed in before the dry weather of summer sets in, and in this climate it would seem desirable to get the peas large enough by the time farmers usually plough the fallows At this time, and before the stems of the pea vines get woody, the chances would greatly favour the more complete decomposition of the manure, and the phosphate applied to the pea crop would all be returned to the soil in equally good condition.

Mr. Sage's questions bring up many suggestions of experiments along the line, and one of my first thoughts is the application of coarse organic manures to improve the porosity of his heavy soils. Then to a comparative trial of green manures. Oats, rye, barley, rape, turnips, and even wheat are non-leguminous plants, which are used largely as green manures, when the prime object is the improvement of the mechanical condition of the soil, and the economic questions involved can usually be worked out best by the man who manages each individual case.

[We do not wish to disparage the use of green manures; their value is incontestable—under suitable climatic conditions. We have, however, some doubt as to the results to be obtained from them in South Australian orchards, situated in districts where the rainfall is limited. Practically our difficulty may be expressed as follows:—Will the useful action of green manuring make up for the great waste of moisture in which it will involve the soil? If the soil is to remain covered with weeds or a leguminous crop, it must necessarily follow (1) that the rain will not penetrate into the soil to the same extent as in bare but cultivated lands; (2) that the losses of moisture through evaporation of the leaves will be considerably greater than from the bare tilled land. Perhaps Mr. Sage's experiments will serve to throw some light on this question.—Ed.]

MILKING OF COWS.

By G. S. Thomson, F.R.S.E., Government Dairy Instructor.

The importance of care in the manipulation of the cow's udder, and what it involves in the quantity and quality of the milk yield and its keeping properties is, unfortunately, not regarded with sufficient seriousness by the majority of dairy farmers. This is illustrated by the perfunctory manner the duties of the milker are carried out, and it frequently happens that the least painstaking person on the farm is entrusted with this very important duty. Milking is often performed by children, and although it is necessary to learn at an early age, it often occurs that too much reliance is put upon the work of the beginner. Some children are undoubtedly clever at milking, and every encouragement ought to be given them, but careful tuition and supervision by the parents is needed before efficiency can be attained. Let the dairyman think this matter over in a diligent way, and consider how easily the milking propensities of his herd are injured. Experience has proved that but little excitement of the cow causes a reduction in her milk, and so sensitive is she to weather conditions that even a sudden fall of temperature is hurtful. But the monetary losses are greatest during the milking process, when wilful punishment of cows is responsible for shrinkage in quantity and a fall in the butterfat percentage. Further, the careless milker forgets that the strippings are the richest of the yield, and repeated neglect to milk thoroughly causes an early drying off of the cow, and goes far to make dairy farming an unprofitable business.

And this does not end the wrongs of the farmhand, for want of cleanliness in milking, and after treatment of the milk, has deprived the industry of much money, and has been damaging to our local and export trade. We, of all dairying countries, must give this subject proper attention, for in it lies a weakness which is almost universal, and until supplies of milk reach our creameries and factories free of acidity and taint, success in butter and cheesemaking is practically hopeless. Our methods in this particular branch of dairying have been severely criticised of late, but we are not behind some Continental countries, where the climate greatly mitigates the net results, which arise from the shortcomings of the milker and farm attendants. But it must be remembered that we have to face the most powerful agent of fermentation—heat—for six months in the year, which should teach us that more than ordinary precautions are wanted to preserve our milk supplies. We ought, therefore, to be in advance of other countries; but such is not the case. In Denmark the farmer is being educated to give especial attention to the milking, and to the aeration and cooling of the milk before it is permitted to leave the farm. This is made compulsory by city milk depôts and some factories, and when this praiseworthy effort has thoroughly succeeded throughout that great dairying country a still better standard will be gained in the quality of the butter manufactured. In addition, the Danish farmer is being instructed to manipulate the udder of the cow in such a way as to increase the flow, and butter fat percentage of the milk. This has been found so successful that experiments have been conducted in the United States with very encouraging results. I would suggest to dairy farmers for experimental purposes the selection of a few cows, and after milking is over restrip them, taking note of the increases in the yield and fat percentages. I hope to carry out some test in this direction during the next few months, and which will be reported in The Journal of Agriculture. It is to be hoped that Agricultural Bureaux in our dairying districts will give encouragement to experimental work in this and other lines of the dairy.

WOOL NOTES.

By G. Jeffrey.

It must be very puzzling indeed to the ordinary sheepfarmer to follow the vagaries of the wool market, in fact, those who are in a position to know best have frequently to admit that they know very little about it. At the beginning of the January series in London practically every one in the trade prophesied a rise, especially in the merino wools, their reasons being based on the increased consumption of wool in the manufacturing centres, but more especially on the admitted shortage of merino wool in Australia. What was the result? Towards the close of the series a sharp and definite drop took place, a drop to the tune of something like 12 to 15 per cent., and, judging from recent letters, had the fall taken place earlier in the series something like a panic would, in all probability, have set in. Happily this panic was averted, and the selling brokers lost no time in drawing the series to a close.

For a time wool people in Australia were more than puzzled to account for the state of affairs referred to, and all sorts of suppositions were indulged in. Now, however, the true position is much clearer, for it appears that the fall was partly caused by buyers finding out that they had been paying more than they thought for wools purchased in Australia. That is to say, that the wool when scoured did not yield such a large percentage of clean wool as they had estimated. This was no doubt on account of the very trying season through which we had passed. The sheep being starved, did not produce much yolk, neither did they produce that solid wool which they would have done under ordinary conditions, thus causing buyers to make an error of judgment. But perhaps the most important fact was just at that time much of the wool shipped direct to the mills was landed in the old country, and for the time being manufacturers were in a fairly good position as far as quantity was concerned, hence they took the opportunity to bear the market.

Since the opening of the new series, things have brightened, and although no great increase on the closing rates of January is reported, still things are very much more hopeful, and those whose judgment I like best, are sanguine that by July wool will be even higher than it was in Adelaide last year. For despite all the little fluctuations which have taken place since our South Australian wool sales closed, the true position is practically this—that merino wools, especially the better class, are now very much on a par with what they were in Adelaide last year, while inferior or earthy wools are a shade easier. Crossbreds of every description are worth quite as much now as they were then while lambs' wool has materially improved in value. I have no hesitation in saying that so far as can be seen, there is no reason to expect that prices will be worse this coming year than they were last. In fact, everything points to a stronger demand for all classes, and it will be surprising if, in the opening sales next September, there is not an all round rise reported.

POULTRY NOTES.

By D. F. Laurie.

Since my March notes the egg-laying competition has received very excellent support. As stated, the test is not such as appeals to my judgment, still I am delighted to find such general interest as is evinced on all hands, and shall do what I can to assist. So far only an outline of the proposed methods has been published, and probably later on the public will be given full particulars.

I have recently perused a bulletin on "Roup" issued by the Ontario Department of Agriculture, and note that the conclusions arrived at bear me out in general. From numerous experiments the authors have arrived at a conclusion wherein they state:—"Hence we are bound to conclude, from the evidence here presented and from other evidence we have at hand, but which space alone prevents us from presenting, that Stevenson's theory is untenable, and that fowl diphtheria is never caused by the human diphtheria germ—the Klebs-Loeffler bacillus." This refers to the opinion expressed by H. A. Stevenson, M.D., who said:—"Roup is caused by a specific germ which appears to me to be identical with the Klebs-Loeffler bacillus, i.e., the bacillus which causes human diphtheria;" and in another place he says—"I believe roup and canker to be the same disease, a disease identical with diphtheria in man." The experiments were, of course, made on fowls, and in no case was the disease caused in fowls which had been infected with the bacillus of human diphtheria. I would point out to the absence of any experiment in the opposite direction, viz., the possibility of fowl diphtheria extending to human beings. Veterinary-Surgeon Desmond and I discussed the question some months ago, and he expressed the opinion that there was no danger, and that the two organisms were different, and required different temperatures. Without disputing any scientific fact, I would refer to standard works on evolution to show the possibilities consequent on change of environment. We can also bear in mind that the scientific world is divided into two parties on the tuberculosis question, and all do not agree with the great Dr. Koch. My contention is that diphtheria is frequently associated with insanitary surroundings, and the condition of affected birds is loathsome; and, despite the opinion arrived at in Canada, I question if any medical expert would deny that diphtheria infested, otherwise roupy, poultry, constitute a grave menace to human beings. I was interested to note that the general symptoms agree with those prevalent here, but no mention is made of the deadly, and almost incurable, form which was common here some years ago, and was known as the "eye disease." In this case the first symptom is a minute white spot on the iris of the eye; the growth is rapid, and the eye destroyed. I have found no reference at any time to this disease, and think it is a form peculiar to Australia; and, at any rate, here is a disease which has its counterpart in the human being, where the eye is often attacked during the progress of the disease (diphtheria) in the throat, &c. The remedy recommended in the bulletin for roup, canker, &c., is one I used in 1886—permanganate of potassium. It is good, but not so good as eucalyptus in the early stages and boracic or tannic acid or chlorinated soda in serious cases. The ulcers so common here in diphtheritic poultry are not mentioned in the bulletin, and, I think, could not have been present, for at all times they constitute a serious feature and somewhat difficult to deal with. I have always contended that a bird apparently recovered from a bad attack of roup is useless for breeding purposes, and that there is always a liability to a fresh outbreak. The Canadian experimenters agree, and state that the germ may remain dormant, after apparent recovery, for months or even years awaiting favourable opportunity to develop. It may lie dormant in the bird or in the soil of the yard; and here I find support in what I have often stated, viz., that the reason why outbreaks of roup so often occur after summer or autumn rains is that the moisture and subsequent heat in the soil make an ideal breeding ground for the organisms which generally find the birds in a favourable condition for attack. Without doubt, dust-laden wind from an infected quarter is an agent in spreading roup germs as well as others. I should like readers to refer to what I have written in the "Poultry Manual" on roup and kindred diseases, and take the necessary precautions. We may have a change of seasons, and a cold, wet winter needs due provision for the wellbeing of the birds. Avoid draughts or overcrowding. I am frequently asked how much ventilation is required; the amount varies according to the weather. The only method is to enter the roosting houses every night and adjust matters. If there is a current of cold air blowing across the birds it will cause trouble; on the other hand, if there is a close, foetid smell, more air is required. It is an extremely difficult matter to regulate the atmosphere in large poultry houses; some of the birds are chilled and others suffocated for lack of fresh air. Actual inspection is the only satisfactory method. Where the houses are in thick scrub or among shrubs or hedges, the matter is simple during cold weather, and very little shelter will be required in the summer. Those who are wise will plant tree lucerne, carob, and other hedges about their poultry runs; they will never regret it. In such cases the houses may be mere shelters against rain, the thick hedges being wind proof. Provision must be made for allowing the birds access to the lee side of the hedge in wet weather.

Advices from Victoria and New South Wales indicate a big demand for stock of good quality. I am informed that there has been a great clearance of poultry in this State during the season owing to high prices of meat, and also cost of food. If it means that there has been a heavy reduction in the numbers of miserable, unprofitable poultry usually seen, I for one am glad, and hope that those who have sold out will make a start with profitable varieties. The national importance of the poultry industry is becoming more clearly impressed on all classes. People are slow to learn, not only in this matter but in most others. The Americans have long offered us a great object lesson in poultry farming. Owing to a few peculiarities of the great people of the States it has been customary to treat all accounts of American poultry farms as so much fiction; but that is now a thing of the past. In America they have a discerning public, who take the best poultry procurable, and are prepared to pay for the same. Here unfortunately very few people know the taste of high-class table poultry, and are apparently content with any scraggy, tough fowl so long as the price is small. We, at any rate, have the export trade which only requires to be developed. Sydney merchants and London buyers in Sydney continue operations which are highly satisfactory to all concerned. I have figures written by the late Secretary of the Board of Exports, Sydney, in answer to my enquiry, which show very excellent returns; and what New South Wales can do we also can do if we like. We should in the next five years treble our egg exports, and send away £50,000 worth of frozen poultry at least.

DEPARTMENTAL NOTES AND WORK.

The Government Gazette of March 26 contains regulations relating to the importation of animal manures. These have been drawn up to prevent the introduction and spread of anthrax, and to prohibit the introduction into the State of any animal manures, except under certain conditions. The regulations provide that "animal manures" should mean and include fodder, as defined in the Stock Diseases Act, 1888, and shall also mean and include bone meal, bone dust, raw bones, green bones, or the whole or any part of the flesh, wool, skin, hides, bones, hair, horns, hoofs, or other portion of the carcase of any stock, as defined in the Stock Diseases Act, 1888. Animal manures may be landed at Port Adelaide only, and not less than 48 hours' notice shall be given to the Inspector of the intention to land such animal manures. No animal manures shall be landed from any place beyond the State without the written permit of an Inspector. All animal manures and all bags and packages which contain or have contained animal manures shall, on being landed, be removed to such place within Port Adelaide as the Inspector shall direct, and shall be subjected for at least two hours to a moist heat of a temperature of not less than 250 deg. Fahr., equal to an indicated steam pressure of 30 lb. per square inch.

The session at Roseworthy College closed with the completion of the vintage on March 5. Of the third-year students, the following gained their diplomas:—Messrs. D. McLeod, W. J. Dawkins, N. A. Seppelt, R. S. Booth, W. J. Spafford, H. G. Lloyd, and D. D. Smith. Four old students, viz., Messrs. W. B. Blue, C. Vaudrey, A. C. Smith, and G. C. Gurr—who had failed in one subject at their diploma examination—came up for re-examination, and passed; they are now entitled to the College diploma. One of the third-year students failed in one subject only, while three failed in two or more branches. The students of the lower classes passed very creditably, and most of them are expected to return next session.

The water had now been laid on to the College buildings, and the drainage waste will pass out to the almond orchard, and will be utilized for irrigation purposes.

Mr. C. T. Jarman, who for 12 years has been farm foreman at Roseworthy College Farm, having tendered his resignation, to take place from March 31, the Minister of Agriculture has appointed Mr. F. L. Faulkner to the position. The new foreman was born and brought up on a farm, and is one of four brothers, sons of a successful farmer of Stansbury, who have taken the college course. Mr. Faulkner entered the College in 1896, having won one of the scholarships open to farmers' sons, and after a generally brilliant career he carried off the gold medal in the early part of 1899. Mr. Faulkner particularly excelled in outside farm work, and during the past four years he has been actively engaged in farming operations. Since leaving the College he has secured the School of Mines diploma in woolclassing.

Mr. F. L. Faulkner has recently visited the Pinnaroo district for the purpose of selecting land on which to carry out experiments in wheatgrowing for the Department of Agriculture. He has arranged with Mr. J. Byrne, of Wow Wow Plains, to put in this year 10 acres of fallow and 10 acres of lay land, and also to fallow 10 acres during the coming winter for next year's test plot. The Department will supply the seed and manure, while Mr. Byrne will take the crop for his labour and the use of the land.

During the month, Mr. Quinn has been kept busy inspecting apples for shipment to Europe and Colombo. He reports the quality and packing to be of a high character. He has also inspected the spraying test plots at

Houghton, Chain of Ponds, Summertown, and Forest Range, and reports good progress. He has lectured at Hahndorf under the auspices of the local agricultural bureau, and gave a public demonstration of summer pruning apple and pear trees at Grunthal. In orchards at Summertown, Forest Range, and Balhannah instruction in this subject has also been given. With a view to supplying vegetables to the institution, and teaching the general principles and practice of vegetable growing, he has laid out a large vegetable garden at the Roseworthy Agricultural College, and will superintend its working in future. A preliminary visit to formally take charge of the orchard at that institution was also made.

During the month 27 parcels of plants and 602 cases of fruits have been admitted into South Australia. Several parcels of plants not accompanied by the necessary declaration from the sender respecting the absence of phylloxera in the neighbourhood from which they originated, have been destroyed. In the same period 16,477 cases of fruits, 19 parcels of plants, and 2,434 packages of vegetables were exported, under departmental certificates. Of these 8,319 cases of mixed fruits and all of the vegetables went to Broken Hill, and 2,250 cases of apples to London, Hamburg, and Colombo. Grapes ,were exported by rail to Sydney to the extent of 4,143 cases, and 1,347 cases went to Brisbane by the same route. This latter market is only just being opened up, and it is to be hoped will prove remunerative to our growers. To show how the abundance of local fruits has checked the import of bananas, only 439 cases were admitted, and 142 destroyed, owing to arriving over-ripe.

During the month Inspector Monks has been engaged 21 days inspecting 270 orchards in the Mount Lofty Ranges, and Inspector Trimmer has occupied 24 days visiting 210 orchards in Barossa districts. During the same period Inspector Pounsett has visited 113 orchards and gardens in and around Penola and Coonawarra, and Inspector Kelly reports having visited 59 plantations in the eight days occupied in inspecting. In each of the districts the Inspectors report good results from the spraying with arsenites, and indicate a considerable increase in codlin moth infested fruits in orchards not sprayed. The Inspectors have also rendered good assistance in connection with the spraying tests conducted in their respective districts.

During the past month Mr. G. S. Thomson (Dairy Instructor) has spent several days in the country districts. At Clarendon he gave a lecture on dairy matters, and at Mount Gambier he took part in the annual conference of the South-Eastern Branches of the Agricultural Bureau. Mr. Thomson also acted as judge of dairy produce at the Royal Agricultural Society's Show in Adelaide, and at the Mount Barker Show. Mr. Thomson is to take up his residence at the College about April 1, and will have charge of the dairy herd and the classes in dairying.

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COUNCIL OF AGRICULTURE.

The monthly meeting of the Council of Agriculture was held on Wednesday, March 25, all the members but two being present.

The School of Mines advised that the wheat-testing mill would be put in operation as soon as the necessary arrangements for its erection were completed.

The Chairman reported that the Minister of Agriculture was generally in accord with the desire of the members that the Council should be placed in the same position as regards the Agricultural Bureau as was occupied by the late Central Bureau, and had promised to favourably consider any definite resolution from the Council. It was resolved to ask the Minister to submit to the Council all such matters in connection with the Agricultural Bureau as were formerly brought before the Central Bureau.

The Railways Commissioner reported that he considered there was no great necessity for ventilated trucks for carriage of fruit, and that 100 trucks would be required to give full effect to the resolution of the Council. There had been little increase in the traffic, which had been carried on satisfactorily in the past. Members generally considered that as far as the interests of the producers and consumers were concerned the fruit traffic had not been dealt with in a satisfactory manner. The Commissioner's statement that 100 trucks were required showed the magnitude of the trade, and was strong evidence in support of the Council's request for better facilities, though the members did not expect nor ask that the Department should at once construct that number of trucks. It was resolved to ask the Minister of Agriculture to endeavour, when money was available for the construction of additional rolling stock, to secure the building of a few ventilated trucks to replace the open trucks now in use.

Professor Towar reported favourably on proposals of Messrs. Dawkins and Marshall in reference to experimental work at the College Farm, and at the request of the Minister the College Committee was asked to confer with the Professor with a view to action being taken to start such work as the funds available will permit.

The Secretary reported that only 47 replies had been received to enquiries re cattle complaints. The questions appeared to be too numerous and intricate to be answered satisfactorily by stockowners.

It was resolved to ask that the district councils be instructed by the Crown Lands Department to enforce the provisions of the Rabbit Destruction Act, especially in regard to simultaneous poisoning and the destruction of the burrows.

CORRESPONDENCE.

[In this column we propose to answer questions of general interest, and also to make selections from our official correspondence. Questions dealing with matters of interest mainly to the writer will be answered direct. Correspondence invited. Ed.]

DO MANURES EXHAUST THE LAND?

Whyte-Yarcowie.—Members of the branch hold the opinion that the continued use of phosphates will so exhaust the land that only very moderate crops will be produced unless other manures are used; also that the use of manure favoured bunt. Members asked the opinion of the Editor on these points.—[1. This is pure speculation. Our soils are naturally poor in phosphoric acid, which fact explains the good results accruing from the use of phosphates. Hitherto other manures, such as nitrates and potassium salts, have generally remained without result. The constant use of phosphates by resulting in heavier crops may, in the course of time, render necessary the use of other manures; but until this has been demonstrated to be necessary by experiment there is no need to trouble about it. The older paddocks at the Roseworthy College that have been dressed consistently with phosphates for over 12 years yield generally results superior to those more recently purchased, and which had not been manured. 2. There is absolutely no foundation for the belief that the use of manures favours bunt.—Ed.]

BLEACHED SEED WHEAT.

Port Broughton Bureau asks whether bleached wheat was as good as sound, bright grain for seed, and whether the bleached seed would be more liable to produce a "bunty" crop.—[The bleached grain is not a perfect grain, and, although we know of no direct experiments on the question, we are inclined to believe that as seed wheat it must be considered inferior to normally coloured grain. There is no reason to infer that it would show any greater susceptibility to bunt.—Ed.]

RED SPIDER.

"A. Q."—There is no remedy for red spider equal to sulphur, but there is some difficulty in applying it to trees. A sulphur bellows—or, better still, a sulphur sprayer—with long tube, could be used. The sulphur must be very fine, and applied on a hot, sunny day. (G.Q.)

MONTHLY RAINFALL.

The following table shows the rainfall for the month of March, 1903:—

Adelaide	2·20	Manoora	1·09	Macclesfield	1·25
Hawker	0·78	Hoyleton	2 09	Meadows	1·87
Cradock	1·46	Balaklava	1·41	Strathalbyn	0·86
Wilson	1·44	Port Wakefield	1·21	Callington	1·16
Gordon	1·40	Saddleworth	0·71	Langhorne's Bridge	0·79
Quorn	1·40	Marrabel	1·33	Milang	0·94
Port Augusta	1·36	Riverton	1·20	Wallaroo	1·39
Port Germein	1·98	Tarlee	1·13	Kadina	1·73
Port Pirie	2·17	Stockport	0·89	Moonta	2·31
Crystal Brook	1·60	Hamley Bridge	0·93	Green's Plains	1·23
Port Broughton	1·93	Kapunda	1·02	Maitland	2·69
Bute	1·98	Freeling	1·16	Ardrossan	1·27
Hammond	1·78	Stockwell	0·79	Port Victoria	2·59
Bruce	1·23	Nuriootpa	0·85	Curramulka	1·63
Wilmington	1·06	Angaston	1·18	Minlaton	1·70
Melrose	1·42	Tanunda	1·22	Stansbury	1·37
Booleroo Centre	1·62	Lyndoch	1·30	Warooka	0 77
Wirrabara	1·14	Mallala	1·52	Yorketown	1·21
Appila	1·37	Roseworthy	1·30	Edithburgh	1·42
Laura	0·97	Gawler	1·41	Fowler's Bay	0·98
Caltowie	1·24	Smithfield	1·34	Streaky Bay	0·97
Jamestown	1·12	Two Wells	1·43	Port Elliston	0·54
Gladstone	0·98	Virginia	1·42	Port Lincoln	0·79
Georgetown	1·06	Salisbury	1·77	Cowell	0·85
Narridy	1·04	Tea Tree Gully	2 53	Queenscliffe	1·02
Redhill	1·09	Magill	3·12	Port Elliot	1·88
Koolunga	1·05	Mitcham	2·20	Goolwa	1·45
Carrieton	1·07	Crafers	3·48	Meningie	1·64
Eurelia	1·35	Clarendon	4·29	Kingston	2·72
Johnsburg	0·99	Morphett Vale	2·29	Robe	1·36
Orroroo	0·77	Noarlunga	2·31	Beachport	1·46
Black Rock	0·67	Willunga	3·28	Coonalpyn	1·45
Petersburg	1·09	Aldinga	3·03	Bordertown	1·01
Yongala	0·81	Normanville	2·57	Frances	0·91
Terowie	1·07	Yankalilla	2·78	Naracoorte	1·73
Yarcowie	0·80	Eudunda	0·49	Lucindale	1·58
Hallett	0·68	Truro	0·57	Penola	1·95
Mt. Bryan	0·80	Mount Pleasant	1·09	Millicent	2·38
Burra	0·75	Blumberg	1·65	Mount Gambier	3·29
Snowtown	1·65	Gumeracha	1·84	Wellington	0·95
Brinkworth	1·03	Lobethal	1·99	Murray Bridge	1·21
Blyth	1·18	Woodside	2·21	Mannum	0·67
Clare	0·95	Hahndorf	2·76	Morgan	0·74
Mintaro Central	1·30	Nairne	1·98	Overland Corner	0·84
Watervale	1·40	Mount Barker	2·00	Renmark	1·30
Auburn	1·11	Echunga	1·72		

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report on April 1, 1903:—

Favourable growing weather during the earlier days in March was followed about mid-month by nice general rains, since which warm and sultry conditions prevailed. Grass and bush have come along well in most country districts, so that if we only get another good soaking rain soon a fine winter supply of stock feed should be assured.

The commercial position continues satisfactory, and trade prospects in town and country are generally favourable; still, excepting, of course, those agricultural areas which suffered so severely during the trying drought. Considerable excitement has prevailed concerning the prospects of the Arltunga Goldfields. Exaggerated statements of rich discoveries of ore probably led some to pay inflated prices for shares in syndicates, but the receipt from admitted authorities within the past few days of adverse reports on several of the most energetically puffed ventures has had the effect of causing investors to halt, so that values have receded to figures that may be justified later by battery tests. Great difference of opinion still exists as to the value of the new finds, some pessimistic folk going so far as to declare the field a fraud. It must not be forgotten, however, that for a number of years many men, under very primitive conditions, have been obtaining a living by gold-finding over a very extensive tract of this same country, so that permanent finds, even if not phenomenally rich, will probably be made as a result of the prospecting now being done there.

London advices describe European weather during February as extraordinary mild, and although cables since show that a severe cold spell was experienced for a few days during March, the appearance of the young wheat plant was all that could be desired English wheats had declined to 25/4 per quarter, the market being reported dull and languid, though Californian Whites were selling at 32/. American markets were generally holding up better than European, although farm prospects there were also favourable for the wheat plant. Australian markets have given way in breadstuffs, Melbourne now being very sick, and Sydney depressed by heavy arrivals of American wheats. The Loch Trool, from New York, with 23,000 bags hard wheat flour, which takes the place of South Australian for mixing, caused quite a slump for a time in demand for Adelaide shipments to the eastern States, and decadedly weakened prices in our local market, as is shown by sales during past few days of two parcels, each 5,000 bags, at 5/7. Fair demand, however, for Adelaide flour has again set in from the east, but America is beating us in Western Australia, where the duties are more in their favour. In forage the market is a little easier, though chaff about maintains, owing to Sydney shipments being made in fulfilment of previous orders. Cape barley firmed up as a result of Melbourne demand. Millers' offal is weak.

Locally-grown potatoes have till now been the chief source of supply for city trade, but as quantities lessen South-Eastern samples take hold of this market and fill country needs, though at moment a couple of small cargoes direct from Warrnambool are being delivered at Port Adelaide. Weekly shipments of "Gambiers" are being made to Western Australia, but it remains to be seen whether this outlet, for portion of our surplus, can be retained, when the Victorian and Tasmanian main crop become ripe enough for distant transport. That the Australian potato yield is this year a heavy ones seems now certain, and also that low prices are likely to rule. Values have given way about 15/ per ton during the month, and cannot surely recede much further. Onions are very cheap, and quality good, so that the consumption of this favourite bulb is likely to be so increased that the heavy outturn this season may not prove too much for demand. Values in this line also dropped about 15 during the month

In dairy products the character of the season has been reflected in the market movement of the several lines. The genial weather has assisted in maintaining milk supplies, so that the output of butter has almost sufficed for current needs, without drawing much upon stocks from refrigerators. What is to become of these speculative holdings of spring-packed butter now held in cold storage throughout the Commonwealth is the serious question asked, not only by those who own such, but to the dairyman, who feels that the value of his newly-made produce is being kept down by the speculative stocks of stored; while cost of production is increased as usual at this time of year by the lessened output, the position does indeed give him grounds for anxiety. Values meanwhile have dropped, and market is weak, with the outlook not cheering. In eggs the month closed at opening rates, though a brief drop of about 2½d. per dozen occurred about mid-month; the market, now under the influence of Easter demand, is, however, strong again. Heavy importations of frozen pork to Sydney from Chicago for bacon making has weakened quotations in hams and bacon, although Adelaide in these continues to rule below other Interstate markets. A relapse in cheese values in Melbourne sent prices back here a penny, but demand keeps up well. Honey quotations unaltered, though sales have slackened a bit. Beeswax and almonds in good demand.

The market for poultry is rather slack at moment, though fair business has been done during the month. Too large a proportion, however, of poor-conditioned birds have continued to reach the city, and with feeding stuff scarce and dear the result, as might be expected, has been very low values for fattening sorts. Turkeys this season, for some unexplained reason, have never reached usual top rates, and at latest sales showed quite an unexpected drop again in price.

Market Quotations of the Day.

Wheat.—At Port Adelaide, shipping parcels, 5/7 to 5/8 f.o.b.; farmers' lots, 5/6 on trucks, per bushel 60 ℔.

Flour.—City brands, £11 15/ to £12; country, £11 5/ to £11 10/ per ton 2,000 ℔.

Bran, 1/3½; pollard, 1/7 per bushel of 20 ℔.

Oats.—Local Algerian and Dun, 2/9 to 3/; prime stout feeding whites, 3/ to 3/3 per bushel 40 ℔.

Barley.—Malting, 4/6 to 4/8; Cape, 3/9 to 4/ per bushel 50 ℔.

Chaff.—£5 2/6 to £5 5/ per ton of 2,240 ℔., bags in, f.o.b., Port Adelaide.

Potatoes.—Locals, £3 to £3 5/; Gambiers, £2 12/6 per 2,240 ℔.

Onions.—Local, £3; Gambiers, £2 17/6 per 2,240 ℔.

Butter.—Creamery and factory prints, 1/1 to 1/3; private separator and best dairy, 11½d. to 1/1; well-graded store, 9½d. to 10½d.; Victorian, new, 10d. to 1/; stored bulk, 8d. to 10d. per lb.

Cheese.—S.A. best factory, 6½d. to 7½d.; ordinary, 5½d. to 6d. per lb.

Bacon.—Factory-cured sides, 8d. to 8½d.; farm flitches, 5½d. to 6¼d. per lb.

Hams.—S.A. factory, 9d. to 10d. per lb.

Eggs.—Loose, 1/1½; in casks, f.o.b., 1/3½ per dozen.

Lard.—In bladders, 7½d.; tins, 7d. per lb.

Honey, 2¾d. for best extracted, in 60-lb. tins; beeswax, 1/2 lb.

Almonds.—Fine softshells, 4½d. to 5d.; kernels, 9d. to 9½d. per lb.

Heavy-weight prime table roosters fetch 1/9 to 2/2 each; well-conditioned cockerels and good hens, 11d. to 1/4; poor and small fowls, 8d. to 10d.; ducks, from 1/4 to 2/; geese, 2/ to 2/9; pigeons, 4d.; turkeys, from 4¾d. to 6d. per lb. live weight for fair to ordinary table birds.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, flour, and forage, for export are f.o.b. prices at Port Adelaide. Dairy products are city auction mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

DATES OF MEETINGS OF BRANCH AGRICULTURAL BUREAUX.

With a view of publishing in the "Journal" the dates of meetings of the Agricultural Bureaux, Hon. Secretaries are requested to forward dates of their next meeting in time for publication.

Branch.	Date of Meeting		Branch.	Date of Meeting.	
	1903.	1903.		1903	1903.
Balaklava ..	April 11	May 9	Narridy ..	April 25	May —
Booleroo Centre ..	7	5	Norton's Summit ..	11	8
Brinkworth ..	3	1	Onetree Hill ..	3	8
Burra ..	17	8	Penola ..	11	9
Cherry Gardens ..	14	12	Pine Forest ..	7	5
Clare ..	10	8	Port Elliot ..	18	16
Colton ..	4	2	Port Lincoln ..	17	15
Eudunda ..	13	11	Port Pirie ..	11	9
Finniss ..	6	4	Pyap ..	15	—
Forest Range ..	9	7	Quorn	11	—
Gawler River ..	10	8	Red Hill . ..	7	5
Gladstone ..	11	—	Reeves Plains ..	9	8
Hartley ..	—	8	Renmark ..	9	—
Inkerman .	7	—	Rhine Villa .	9	8
Johnsburg ..	11	—	Riverton ..	11	9
Kanmantoo ..	8	8	Saddleworth ..	17	—
Kapunda ..	4	2	Stockport ..	6	—
Kingston ..	4	2	Strathalbyn ..	20	18
Koolunga ..	9	7	Swan Reach ..	11	9
Maitland ..	4	2	Wandearah ..	6	11
Mount Compass ..	4	—	Whyte Yarcowie ..	18	16
Mount Remarkable ..	9	7	Willunga ...	4	2
Nantawarra ..	8	6	Wilmington	6	6

AGRICULTURAL BUREAU CONFERENCES.

NORTHERN YORKE'S PENINSULA BRANCHES.

A Conference of the Northern Yorke's Peninsula Branches of the Agricultural Bureau was held at Brinkworth on February 11, Mr. A. L. McEwin (Chairman of the local branch) presiding. There were present the following delegates:—Messrs. S. Trengove (Bute), W. S. O'Grady and J. P. Pontifex (Paskeville), T. B. Butcher, J. W. Atkinson, J. Sandow, R. Palmer, jun., W. T. Cooper (Koolunga), R. Barr, jun. (Pine Forest), A. F. Herbert, and R. Nicholls (Nantawarra), A. L. McEwin, J. F. Everett, S. Aunger, C. Ottens, G. Wooldridge, G. Freebairn, W. H. Shepherd, W. Welke, A. W. Morrison, W. R. Russell, A. Jericho, T. Hill, and J. Stott, secretary (Brinkworth). Professor Towar and Mr. G. S. Thomson (Dairy Instructor) were also present. There were several exhibits, including 40 samples of cleaned wheat, six in the straw, some splendid cucumbers grown by Mr. C. Ottens, of Brinkworth, and grapes and tomatoes, produced by Mr. J. F. Everett, of Brinkworth.

CHAIRMAN'S ADDRESS.

Mr. McEwin opened the Conference with a welcome to Professor Towar and Mr. Thomson. From the former gentleman the farmers of South Australia hoped to gain much useful information. He believed that their farmers would compare favourably with those in any part of the world, but they were not above learning from others. The Professor had a very difficult position to fill; he was expected to undertake experimental work of all description, to grow better crops than his neighbours, and make the College pay its way, to impart knowledge to the students, and to run all over the country lecturing and teaching the farmers. He would have to bear criticism from all and sundry. Personally, the Chairman thought it a great mistake for Parliament, or any one else, to expect the College to pay; if it was to be a success numerous experiments must of necessity be undertaken. Such work was expensive, and usually unremunerative to the College. He complimented the Professor on his remarks at the September Congress about the price of farm implements. This was a matter that concerned them very closely, and the Bureau should take it up and see if something practical would not result. He was disappointed that the South Australian Farmers' Co-operative Union had not taken the matter up vigorously. The profits from wheat at 2/6 per bushel was rarely large, and often the farmer seemed to work the whole year for the benefit of the importer of implements, &c. He would like to refer to criticism of their recent official visitor from Russia, who condemned the farmer's wife as too much of the "lady," and incidentally suggested that South Australian farmers lived too well. The Chairman said he considered the farmers' calling a noble one, and he was glad that they did not in South Australia see the womenfolk in short frocks working in the fields as their Russian visitor evidently expected. It was a libel to say that the farmers' wives and daughters were lazy. In conclusion, he would say that there was no doubt that in the near future they would have to turn more grain into feeding stuff, and send it off their farms in the shape of beef, mutton, eggs, poultry, pork, &c., but supply and demand would regulate this matter. It was to be hoped that some large mining centres would yet spring up to take their produce to obviate the need of sending it over the sea.

ECONOMY ON THE FARM

Mr. R. Barr, jun., read a paper on "Economy v. Extravagance on the Farm." It was mistaken economy to half-starve the farm stock. The horses were unable to do their work properly, and milking cows were a distinct loss instead of a gain to their owners if restricted in their food or water supply. It was always better to understock rather than overstock. The worst form of extravagance on any farm was to buy or breed more stock than could be properly fed. Securing the services of the best sire was, in the end, economy; a good animal costs no more to rear than an inferior one, but is far more profitable. Implements should be of good quality and up to date. They must be well looked after and cared for; it was extravagance to leave any machine composed wholly or in part of wood outside, exposed to the weather. In regard to repairs, there was great truth in the old saying, "A stitch in time saves nine." There was, however, a time in the life of all farm implements when it was more economical to purchase a new machine than to spend money in repairing the old one. All farmers in that locality had learned that wheatgrowing could not be profitably carried on without the use of manures, and they were learning slowly how to use it to get the maximum return from the money laid out in manure. When a farmer knows that he can get more profit from the application of 1 cwt. per acre than from half the quantity it is the height of extravagance to put on only the minimum dressing. It would pay him better to put the manure on a lesser area, and save seed and labour, besides having more land for grazing. Then there was the question of the quantity of seed per acre; this will vary according to local conditions. His experience was that on their light, sandy soils 30 ℔. per acre was sufficient, and anything over that was waste. The seed must, however, be good and free from oats, drake, and other foreign seeds. They all believed in fallowing, experience having taught them that they can reasonably expect double the crop from fallow as from lay or stubble land; but the argument against using the small quantity of manure does not altogether apply to the cropping of stubble land, because a cheap crop can be grown the second year after fallow, and the land will be in better condition for grazing. He deprecated burning the stubble as extravagant; the crop on the land to be fallowed should be cut with the binder. He would advise, on the score of economy, spending a few days each year in renovating, repairing, and painting the buildings, straining-up wire fences, &c. The tools should all be kept in good order, and a supply of bolts, nuts, rivets, &c., kept on hand.

TILLAGE TO CONSERVE MOISTURE.

Professor Towar gave an address on this subject. The farmer in South Australia had to depend practically entirely on the winter rains for moisture for his crops; the showers registering only a few tenths of an inch had no lasting effect, as the moisture was quickly evaporated. The farmer must, therefore, consider how best to conserve the moisture that falls in winter. Ploughing early to let in the winter rains was a good practice; subsoiling was likely to assist. While deep ploughing might not be practicable here, he thought the depth generally ploughed, i.e., 3 or 4 in., scarcely sufficient. He doubted whether they would lose any moisture through the rain going too deeply into the soil. Having secured the penetration of the moisture in the open soil, the next thing was to conserve it for the crops. The methods which will prevent or retard evaporation were the methods to follow to get good crops. A loose surface mulch of soil will do this. Cultivation for the conservation of moisture will pay even if there are no weeds to destroy. The question of the thickness or depth of the soil mulch had been the matter of numerous experiments, and in dry areas it was found that it should be not less than 3 in. at the commencement of the summer, gradually diminishing until seeding time to about 1½ in. There should be plenty of loose soil above the seed, but none below it. The earth mulch would not need to be disturbed if there was no rain, but after rain it should be recultivated as soon as possible. He advocated the depositing of farmyard manure on the field directly it was produced. Its fertility would then go into the soil, and none of it would be lost. Another means of securing a mulch was by the growth of vegetation. The wind was a very active agency in promoting evaporation, and vegetation, and even low stubble, would have a good effect in preserving the moisture. Although it was not possible to save very much moisture after the wheat was sown, it was found that the process of rolling had a beneficial effect. A young wheat crop could also be gone over with advantage with the light harrows. He tried it on a small patch at the college last year, but stopped it because he was afraid to do more. The results, however, were very satisfactory, as the weeds were killed and the crop looked much better than in the other parts of the same field. He believed the harrowing helped somewhat to conserve the moisture in the soil. He had been watching with interest the practice of one of his neighbours—the Chairman of the Reeves Plains Agricultural Bureau—of harrowing his wheat stubbles. Theoretically it was a good thing, and he believed it would have a satisfactory practical result. It would tend to prevent the waste of moisture. In the country where he came from four bushels per acre more was obtained from land that was cultivated immediately after reaping than from that which was left undisturbed until seed time. Speaking of the ploughing in of green manures, he would advocate it if the land was well saturated, but he recognised that there would be danger in it in dry conditions. If they could get it thoroughly mixed with the soil the organic matter of the green manure would assist in the retention of the moisture. Leguminous plants were the best for this purpose, as they took a certain amount of nitrogen from the air. On the question of level or ridged cultivation the Professor said that had to be determined by the conditions. The more ridged the land the greater the loss from evaporation, but the smaller the loss from drifting. He preferred level cultivation, excepting where there was likely to be loss of soil through drifting.

DAIRYING.

Mr. Thomson (Dairy Instructor) gave some information concerning the dairying practices of Denmark and elsewhere. On the Continent of Europe the dairyman carried on his operations on a scientific basis, and the result was seen in the high and uniform quality of the butter exported to England. It was true that in South Australia it would be very difficult, if not impossible, to follow out some of their methods, as the farms were not in close proximity to the factories, but there was plenty of room for improvement. Our products could be made equal to the best in the world, but the farmer must give more attention to details required to keep the milk or cream free from contamination In his opinion there were considerable areas in the mid and lower north eminently adapted for dairying pursuits.

JUDGING HORSES.

Mr. W. H. Shepherd read a paper on "Judging Horses." As the object of their shows was to promote the knowledge of the best of everything, and the judges should be able and willing to inform the unsuccessful competitor where and in what way he failed to gain the reward. Each year the same complaints are made, i.e., favour shown, not in any particular class of stock, but in all classes. If the judge was to point out where the first horse had beaten the second, and the second the third he would prevent a great deal of the dissatisfaction, and people would then compare the points for themselves, and in the majority of cases would find the prizes were awarded correctly. They ought never to condemn the judgment from outside the show ring, as is repeatedly done, as a closer examination will often disclose side bones, contracted hoofs, or other faults which make the horse unfit for show purposes. The judges should always have the foot lifted to enable them to examine it. This is seldom done, and I am afraid the feet are not taken nearly so much into consideration as they should be. There are a number of horses capable of showing to an advantage on soft ground, but if put on the metal are almost useless, especially in hilly country. It was a difficult task to judge horses correctly, as there are so many points to be taken into consideration, and he failed to see how any man can judge two horses nearly equal in appearance without the assistance of notebook and tape. In his opinion the horse for farm work should have a broad jaw, ending, as a rule, in a not very fine or well-developed muzzle, but with large, open nostrils. The eye should be full and vigorous, yet mild, and the forehead broad and full. The ears should be long and active, but not pointed or inclining inwards. The neck should be strong and massive, supporting the head gaily. He was not a believer in a lot of hair on the horse, although it showed breeding and strength of bone. The back of a horse should be straight, the barrel round, with deep ribs going well back to the quarters, and beasts with fleshy hocks should be avoided. A horse of this description should be active, and have power of endurance, and be capable of drawing a good heavy load to market with comparative ease at a fair rate of speed, say, 2½ miles an hour. The better shaped a horse was the less feed he would require; a big horse, well made, would not require nearly so much feed as a smaller one with a long back and short ribs. The farmer, by keeping the better class of horse, would not only require less harness, but would have fewer horses to feed.

STALLION TAX.

Mr. T. B. Butcher (Koolunga) started a discussion on the proposed stallion tax, and opposed it, as he considered it an interference with the liberty of the subject. A suggestion was made that the animals should undergo a veterinary examination. Eventually a motion was carried disapproving of the tax. Votes of thanks to the Chairman, the secretary (Mr. J. Stott), and the Press concluded a successful conference.

RIVER MURRAY BRANCHES.

The annual Conference of the River Murray Branches of the Agricultural Bureau was held at Mannum on February 25 and 26.

Mr. J. G. Preiss (Chairman of the local branch) presided. The following Branches of the Agricultural Bureau were represented:—Swan Reach, Gumeracha, Kanmantoo, Mannum, and Mount Pleasant. Professor Towar and Messrs. G. Quinn and G. S. Thomson represented the Department of Agriculture. In addition to members of the Bureau, a considerable number of visitors were present.

The Chairman opened the proceedings with a short address of welcome to the visitors, and then called on Professor Towar to give an address.

PLANT FOOD.

The plants must be fed, for they were living things, and their lifetime or life processes must be continuous. The functions of the roots and leaves were practically the same as certain functions which made animals capable of existing. The plants must be recognised as living things, and needed certain foods to enable them to grow. They were incapable of changing one element into another. Of the elements found in plants all excepting two were taken into the roots in solution, and their concern was mainly with these elements. First of all, however, water was needed to dissolve the elements in the soil. The problem was to do the most with the water they received. Soils usually contain sufficient fertility to make plants grow satisfactorily for a number of years, but the question of getting this food in a proper condition for the plants was of great importance. As certain foods, until prepared, were in an indigestible condition for the human being, so must the plant food be made into a condition suitable for assimilation by the roots of the plants. It was not sufficient if the plants had the assistance of water only. There must also be a certain degree of warmth and air in the soil. Tillage in a sense tended to bring about the proper condition. The objects of tillage might be laid down as (a) to assist dissolving out the plant food by the friction it caused and exposure to the air; (b) to encourage the ferments in the soil in preparing plant foods that were there; (c) tillage admitted air to the soil, and thus improved its texture. Probably, however, the most important object of tillage in arid regions was that it would make the soil hold more moisture. In our dry country they must take advantage of the winter rainfall, which they must hold over for the succeeding crop. It was unsafe to depend on the summer rains to help the sowing in the next seed time. There were vast areas in Australia where nearly all of the rain either flowed off the surface, was taken up by the crops, or was evaporated into the air. The tilled layer on the surface prevented to a great degree the surface evaporation. They could also retard the escape of moisture by a covering of straw or by drawing out coarse manures on to the field. This, however, was not always practicable, but by breaking down the stubbles they would lessen the evaporation caused by the action of the sun and wind. Most of our soils had shown that even where chemical analyses indicated the presence of a fairly high percentage of necessary elements small dressings of soluble phosphates had increased the yields. He thought the reason why small applications of soluble phosphates were successful was that the phosphoric acid in the soil was combined with other elements, and not in a condition suitable to the needs of the plants. Until the young plants were capable of dissolving the natural phosphates they drew upon these manures as the calf lived upon the concentrated natural food until it could assimilate the other foods containing the necessary elements of nutrition. Similarly with nitrogen; they found that applications of very soluble forms of nitrogen would give good results, even in ground where analyses would indicate the presence of a large surplus. The most favourable conditions existed in South Australia for developing the nitrates in the soil, and the system of fallowing was recognised as the best possible means for preparing the insoluble nitrogen for the plants. At first it struck him as unwise to leave the fallows bare, as where he came from 6 in. or 8 in. of rain fell through the summer months, and these nitrates would be washed down away from the roots. Here, however, he realized there was no danger of this, and then experience thus far showed no need for the application of nitrates.

In answer to questions, Professor Towar said the lack of rainfall certainly made the dissolving of the elements in the soil a slower process. To produce a crop of 20 bushels of wheat to the acre the plants must use up about 6 in. of rain. He believed that an accurate knowledge of the chemical constituents of the soil could only be suggestive in value. He did not think any one could advise with certainty from an analysis what a soil needed. For instance, the swamp soils in America, on which one naturally would think anything of an organic nature would be useless, gave the best results from farmyard manure. In other soils of granitic origin which were heavily charged with potash they found potash manures gave profitable returns. The analyses showed how much food the soil contained, but it did not show how much was actually in condition to be utilized by the plants.

Mr. W. G. Mills, of Kanmantoo Bureau, read a paper on

SHEEP AND THEIR PASTURES.

The best sheep for the farmer was the one which returned the most money for the least feed and attention. Some claimed that the mutton breeds would do that, but he favoured the merino. The Shropshire, Dorset Horn, and other breeds carried off the palm for the fat lamb trade; but for the heavier clip of wool and quiet, contented habits the merino came out best. As a fat lamb producer he thought insufficient attention was given to the Southdown, and suggested getting first cross ewes between Dorset Horn rams and the best merino ewes, and then use the Southdown ram with them. With plenty of green grass and water he believed a good fat lamb of best quality could be quickly raised. He would like to see the merino improved on certain points, viz., early fattening, increase the woolbearing qualities. If these were gained the merino would be unsurpassed. To get the full benefit from their sheep they must feed them well. The introduction of stud rams would not benefit a half-starved flock, and a ram always well nourished soon deteriorated on poor pastures, and his stock did not stand hardships like inferior sheep. The "survival of the fittest" where land was overstocked usually meant the beast with longest legs and least fat or wool to carry. He preferred a pretty large sheep with short legs, deep body, and of thrifty habits; dense, even fleece, with both quality and length, and with an even close tip. That fleece will keep out the sand pretty well. The ewes should be selected when they were lambs, noting the above characteristics. Every man could not be a ram breeder; but he should select his ewes. Next to selecting their sheep they must attend to improve their pastures. When the hot sun dried up the herbage the treading of many sheep cuts up the surface and allowed the best of the soil to blow away in the form of fine humus, which naturally collected around the roots of the plants and grasses. He advised keeping the sheep upon land retained for fallowing during the growing period of the grasses. That gave the pasture land a chance to become fully clothed. He believed in some localities belts and clumps of trees could be planted with great advantage to the sheep and pastures, as the force of the wind was broken, shelter and shade were provided, and the nourishment needed to form fat and wool was not expended in keeping up the animal's vitality alone. He advocated small paddocks with good water in each. In most localities troughs holding rock salt should be within reach of the sheep at any time. It caused them to eat more and digest better what they ate, and thus kept them in better condition.

Mr. Viger thought more general care should be exercised in the get-up and classing of the farmers' wool clips, but the Chairman said in his experience it did not pay, but admitted the wool he had sent unclassified was of a different character and more valuable as a rule. In reply to questions, Mr. Mills said a satisfactory average fleece for him on a merino ewe in lamb was between 8 and 9 lb. of wool.—Mr. Thompson said he could not get it, and doubted its accuracy when applied to a flock.—Mr. Mills said he had cut 15 lb. of wool from selected ewes, and a small flock averaged 12 lb., and each bore a lamb.—The Chairman said notwithstanding the bad season, he had raised 90 per cent. of lambs, and had sold them all between 4 and 5 months old at an average of 10/ per head. He had drilled oats into the stubbles and depastured the lambs upon them.—Mr. Mills said it would not pay to sow wheat at 5/ per bushel for feeding off, but he had grown Planters' Friend and fed it off, and reaped 25 bushels of wheat per acre off the land in the following season.

At the request of the Conference Professor Towar addressed the meeting briefly on

FARMYARD MANURE.

He recognised that the management of farmyard manure was different in South Australia to that in a country with a heavy rainfall; but he believed the farmers in this State put far too low a value upon coarse manures. It might not pay them, but it appeared to him to save labour to carry it direct from the stableyard on to the field. The waste was reduced to the least possible amount. Conditions in South Australia might contradict that practice. In stable manures there were found all the elements needed to make plants grow. The manure was made up of plants that had grown, and if properly secured the fertilising elements would be returned to the fields, for they found the digestive processes of the animals took out only about one quarter of the elements. He believed that more than half the fertilising value was in the liquid manure of the animals. If they were to go into the problem of conserving manure they must make more use of the liquid excreta from their animals. Straw could be used as bedding, but whether it would pay was for the practical man to work out. The quality of the liquid manure was better than that of the solid, because more was in a soluble form ready for immediate use by the roots. Farmyard manure, besides fertilising the land, improved the physical texture of the ground if well mixed with it. That proviso was necessary and important, or injury might result. The fermenting agencies in the soil would make it available to the plants. Mixing it with the heavy soils would make them more open, and cause them to take in more water and hold it longer. It was thought at one time that if spread out in the fields and exposed to the sun the ammonia would pass off into the air. If put in a pile the manure heated, and ammonia could be discerned passing off. Pouring on water or spreading to admit air freely would stop that heating which encouraged fermentation, and which converted the organic nitrogen into ammonia. If the heating were prevented those processes went on very gently, and the gas was not formed faster than it could combine with other elements which held it. If rain fell at once soluble fertilising matter was lost by washing, or the winds might blow a little away. It was found that that soluble material would wash out at once, but would be sucked into the ground, and continuous rain might cause a loss by the under drainage. Evaporation did not affect the manure, as only water was lost, and the manure when spread upon the surface tended to prevent evaporation from the soil. Under intense cultivation the storage of manure in pits to ferment slowly was best, because more of it was then ready for immediate use by the plants, and the land could not be spared to allow it to be spread out to decompose slowly. Weed seeds were said to be killed by fermenting the manure in pits, but that was only a partial truth. Covering the heaps of manure with earth so as to assist in retaining some of the nitrogen and gypsum was better still. In America, owing to the great rainfall, they could not cart on to the land for weeks at a stretch, and there they stored the manure in sheds and kept it wetted, as rapid fermentation would not go on only in a normal amount of moisture and warmth.

The Chairman said in his locality farmyard manure used on the surface prevented the sandy soil drifting.

IRRIGATION.

A desultory discussion took place on this subject, and there seemed to be a consensus of opinion that in suitable spots irrigation could be carried on along the Murray for raising fodder crops for dairy cattle. In special places it might pay for certain kinds of fruits. Considerable stress was laid upon the necessity for preventing the ingress of sea water at the Murray Mouth, and upon preventing Victoria and New South Wales drawing too heavily upon the river before it entered South Australia. As one speaker put it rather forcibly—"Unless they are prevented from doing this there will be no water left for us to irrigate with."

Mr. G. S. Thomson, Government Dairy Expert, addressed the meeting on

THE SCIENCE AND PRACTICE OF DAIRYING.

In a dry country like South Australia the two first considerations of the dairymen should be to provide succulent summer feed, and a good, clean water supply for the cows. He specially commended lucerne, as it contained protein matter. A quarter of an acre of lucerne was worth more than 5 or 6 acres of dry feed crops, because they did not contain the necessary milk and flesh-forming properties. He believed the disease known as impaction arose owing to the lack of green food for the cows over a very long period during each year. Dry feed might be nutritious, but there was an excess of fibrous matter in it which lodged in the leaves of the stomach and brought about inflammation. Cows fed liberally with various commercial food substances had, even at an advanced period of lactation, gradually increased their yields and left a good profit over the cost of the feeding. In reply to questions, Mr. Thomson said it was not advisable to wash the udder before milking unless it were very dirty. If that was done water of reasonable temperature should be used. If no dirt was showing they should brush the udder with a damp cloth, as that would moisten any particles of soil and prevent them falling into the pail. Hand separators had encouraged dairying in South Australia, because the farmers did not like creaming the milk with pans. They had also improved the quality of the butter in the State. At the same time, in the hands of careless persons, a lot of injury had been done to the butter trade. He laid great stress on paying proper attention to cleaning the machines. It was a great mistake for farmers to use hand separators next door to the factory, as in the factory trained men were engaged, and the machinery was usually better. The carting of cream over long distances, with shaking and exposure, was conducive to deterioration.

Mr. G. Quinn (Government Horticultural Instructor) addressed the Conference on

HOW TO DEAL WITH SOME COMMON GARDEN PESTS.

The pests selected by the local gardeners were black aphis of peach trees, red spider, orange scale, and cabbage moth. After describing in detail the life histories of the pests, he explained how and when to look for each one, describing the symptoms and appearance of the plants when attacked. As a spray wash for peach aphides he recommended tobacco and soap; one ounce of the strongest tobacco and three ounces of common soap boiled together would make four gallons of wash. The secret of repressing that insect lay in frequent sprayings, as they bred very rapidly. He described the experimental work done in fumigating with hydrocyanic acid gas for the destruction of the pest, but did not commend its use to amateurs or small growers on account of the cost of the gas tents and the dangerous nature of the chemicals used. For the red spider he advocated dusting the plants with sulphur during very hot weather. The black scale of the citrus trees was readily controlled with resin wash or kerosine emulsion if the tops of the trees were kept open to the passage of light and air. Red scale was more difficult, but the same remedies restricted it very much. A resin wash he recommended consisting of boiling up 1 lb. of common resin, 1 lb. of washing soda, ½ lb. common soap, in five gallons of water. He believed in commercial citrus culture the fumigating process with hydrocyanic acid gas would ultimately supersede spraying. For the cabbage caterpillar he recommended spraying with Paris green, but only before any hearts had formed. Tar water had also been found valuable: while tobacco and soap wash, kerosine emulsion, and resin washes had proved useful. The secret of success lay in planting out healthy, sturdy plants, keeping them growing strongly, and if spraying were necessary to apply the spray to every side of the leaves and shoots.

Mr. E. P. Weyland gave a short address on

CULTIVATING LAND IN THIS DISTRICT.

He advocated burning all rubbish cleanly, and in ploughing to turn the soil right over, and then to harrow it well to keep the moisture. During the second year he would clear the stubble off either by burning, or would drag it down with a log and chain, and break down any mallee shoots. If the stubble were covered in it caused the soil to dry out. The land should not be cultivated more than three years, and after that given a two years' spell. There ought to be a change of seed every three years. The early wheats were the most suitable for these parts. The wheat known as Newman's had proved a good one with him. If oats were sown the last year, the Algerian or Cape oats did best in the sandy land. The ploughs manufactured in the locality were suited to the work, as they not only turned the land over, but smashed it up. Much wheat had been lost in the stripping owing to the low crop. The combs of the strippers were, in his opinion, too wide. If the stumps were taken off binders could be used, and a better return secured.

Mr. Preiss said he had sown oats with a little superphosphate, and had left the land out for grazing in the following year. A good stripper did not waste more than a few pounds per acre. If the stumps of trees were cut low the crop might be cut sufficiently green to use the straw for chaff to feed to stock, and he found such chaff increased the quantity of milk from dairy cows and made the butter firmer. He wished to know if dun oats had been tried, as they did not grow so tall. He believed they would yield a fair crop where other sorts would not come out into ear. The plant was spreading in habit, thrived on sandy soils, and made good hay. Mr. Fairy believed if fair crops were borne for two years the land should be allowed a rest. Some cropped one year and spelled it two years to grazing.

Mr. J. G. Preiss read a paper on

WATER CONSERVATION ON FARMS.

He said although many farms adjoining the river and creeks which flowed across the flats were fairly well supplied with water, there were many on the Murray lands to which the subject was of vital importance. It was now recognised that to be profitable grazing must be combined with the cropping. The lack of water was a great obstacle in the way of stock keeping on the Murray Flats. In many parts of the district dams and reservoirs could be seen on farms along the sides of the roads, on which the traffic had hardened the soil and made a sort of run for the water. That gave a supply, but the drawback was that the water would not run unless there were heavy showers, and then muck and filth gathered by the waters enter the reservoirs, spoiling the water and causing extra labour in cleaning out the receptacles. He believed by preparing a suitable catchment a supply of wholesome water could be secured sufficient for all the stock the land could carry. Where the land was undulating the slopes could be used, and on level ground a slope could be made by taking a single-furrow plough, and start a half-chain land by four chains long. When finished ploughing they should take a scoop and shift the soil from the furrow to the outsides, so as to form a gradual slope towards the centre. The ground should then be well rolled, and a surface of concrete put over it. With plenty of limestone and wood with which to burn it, the cost would be small. A good concrete could be made by taking two parts of screened limestone rubble to one part clean sand and one part of fresh lime. The lime should be slacked on the rubble, and the concrete, made by mixing those proportions, should be laid down as quickly as possible to a thickness of 2 in. If well smoothed on the surface it would make a good catchment. A very thin crust of cement put on before the concrete was quite dry would perfect the surface. At the lower end of the catchment a reservoir should be excavated. That should have a capacity of 20,000 gallons. A rainfall of 8 in. would precipitate about 32,000 gallons on the catchment area, allowing 12,000 gallons for evaporation and soakage. On a steep slope the quantity caught would be greater. The catchment area should be enclosed with a good, substantial cattle and vermin proof fence. Where there was any danger of sand drifting a brush fence should be made about a chain away from the area to stop the drift He estimated the cost of the catchment area and reservoir would be as follows:—Construction of catchment area, 968 yards at 6d., £24; excavating reservoir, 161 cubic yards at 2/6, £20; building reservoir, 115 square yards at 5/-, £28; fencing area, £4; total, £76. That estimate was for the work if let by tender, and included the whole of the materials. If the farmer supplied the limestone and rubble the cost would be much less. Expensive as that system appeared, it compared favourably with the method of water carting now in use—the amount of labour expended in filling tanks by hand pumps, hauling the water five or six miles, and this generally at a time when the teams should be working in plough or stripper. There was also the wear and tear on harness and wagons—and nothing damaged a wagon more than water carting. The tanks required renewing every second or third year, and after all this labour and expense there was barely enough for the stock and domestic purposes, and a bath was quite a luxury. That went on from year to year unceasingly If that amount of capital, labour, and time was spent on carrying out the project outlined, water carting would soon cease, and the farmer would be relieved of much anxiety, and be in a position to produce more from his land.

The paper was favourably commented on, and the general opinion appeared to be that the writer had overstated the cost of constructing the catchment and reservoirs. The use of clay in place of concrete was suggested, on account of breaks being easily repaired.

The usual votes of thanks concluded a very successful gathering.

DISEASES IN ANIMALS IN GREAT BRITAIN.

There has been a marked decrease in the number of outbreaks of swine fever during the year 1902--viz., 1,688, against 3,140 for 1901; 8,263 swine were slaughtered as diseased and exposed to infection, against 15,237 in the previous year. There was one outbreak of foot-and-mouth disease, with 118 animals attacked. Glanders, including farcy, still claims a number of victims, there being 1,162 outbreaks and 2,073 attacked. Anthrax appears to be slightly on the increase, 687 outbreaks, with 1,042 animals attacked, being the record. Rabies, notwithstanding the precautions taken by muzzling and quarantine, have increased, 13 dogs and 12 other animals being attacked. The attempts made to eradicate scab seem to be a failure. No doubt the difficulty of dealing with so many small flocks and the absence of vigorous action to ensure the thorough dipping of all doubtful sheep are some of the reasons why this easily eradicated pest is not stamped out. In the month of December there were 350 fresh outbreaks in 47 counties; whilst sheep scab existed in 57 counties.

AGRICULTURAL BUREAU REPORTS.

Norton's Summit, January 16.

Present—Messrs. Cowling (chair), Hank, Bishop, Smith, Horsnell, Giles, Playford, Pollard, and Osborne (Hon. Sec.).

Codlin Moth.—The Chairman stated that eight weeks elapsed between the date he caught the first codlin moth in his fruit house to the date the last was secured. In January, last year, he caught the moths ten days after storing the apples.

Cherry Stock.—The Chairman gave an interesting address on cherry stocks. There were three varieties used, viz., Kentish, Seedling Sucker (a Mazzard seedling or first sucker from seedling), and the Mahaleb, which did not sucker. If he were planting cherries he would now discard the Mahaleb stock altogether, as it had not fulfilled expectations. He would work Early Lyons, Margaret, and Waterloo on either the Kentish or Seedling Sucker; the Early Purple Guigne and Black Tartarian on Kentish only; and the Twyford, Knight's Black, and Bigarreau Napoleon, on Seedling Sucker. Considerable discussion took place on this subject. Mr. Giles preferred the Mazzard stock generally, as with the Kentish the union was not always good. Trees worked on the Kentish stock do not thrive if cut down and reworked. Most of the members agreed with the Chairman in condemning the Mahalab stock for the Early Purple Guigne.

Minlaton, February 21.

Present—Messrs. Martin (chair), Twartz, Vanstone, Boundy, McKenzie (Hon. Sec.), and four visitors.

Sheep on Farms.—Mr. Boundy read a paper on this subject. It was generally admitted now that the keeping of sheep, in conjunction with wheatgrowing, was profitable, especially where the rainfall is fairly reliable. The number and class of sheep to keep must depend upon size of farm, quality of land, and the natural advantages of each particular locality. Dealing with the holdings in this locality, he would like to point out the profits to be derived from the raising of lambs for sale. Farmers as a class were apt to get into grooves from which they were difficult to move, and many stick up for the merino on the farm because they have never kept anything else. He considered the merino unprofitable in this locality; practically the only source of income was from the wool, the lambs being mainly of value to keep up the flock numbers. The farmer feeds the ewes for 12 months for a general average of 8 lb. of wool worth 6d. a lb.; a poor return for feed and labour when compared with the profits from fat lambs. He favoured crossing the merino ewes with Shropshire rams; for a flock of 300 ewes, four good rams will be sufficient. The lambing should average at least 80 per cent. fit for market; with plenty of feed and water the lambs at four months should range from 70 lb. to 90 lb. live weight. Ewes for breeding should be from six-tooth to two years over full mouth; they should be well developed and roomy, and will be quieter than young sheep. The ram should be low in the legs, with good quarters, broad back, good loins, and well-developed breech. A good two-tooth ram can be had for five or six guineas, and it will pay to buy only good animals. The lambs should be dropped from April to June; shift the ewes as they lamb to a reserve paddock with good feed. It is a good plan when oats are cheap to broadcast them on the stubble paddock, and cover the seed with harrows or cultivator. The oats will come up with the first rains, and provide early green feed. When the ewes become too aged to rear strong lambs fatten them off and sell, purchasing merino or crossbred ewes to take their place. It will pay to give 10/ per head for good six-tooth ewes for breeding purposes. His estimate of the yearly income from a flock of 300 ewes was £160 10/, made up as follows:—240 lambs at 8/, £96; wool, at 1/, £12; wool from 300 ewes, 7 lb., at 6d., £52 10/.

Crystal Brook, February 7.

Present—Messrs. R. Pavy (chair), Hutchison, Miell, W. and A. Hamlyn, G. and G. M. Davidson, Morrish, P. Pavy, Venning, Western, Townsend, and Symons (Hon. Sec.).

Roadmaking.—Mr. Hutchison read a paper on this subject. In forming the road, loosen the surface right across; often one side only is touched because the other happens to be the right level. This will result in the road wearing down lopsided. When formed, roll well, afterwards filling up any depressions that show, taking care to get it level and firm before metalling. It was a mistake to put 6-in. metal into the foundation; 2½-in. stone right through will wear better and longer, though costing a little more at the start. He had seen the greater durability of this system demonstrated practically on the roads in various parts. The metal must be rolled well with a heavy roller; often the rollers were not weighted sufficiently. A 6-ft. roller, drawn by five horses, may weigh 6 tons; a good wagon will carry an equal weight on 16 in. of tire, hence the necessity for using heavier rollers, to consolidate the metal. Considerable discussion ensued.

Elbow Hill, February 12.

Present—Messrs. Robertson (chair), Ward, Rhen, Harvey, Wake, H. and G. C. Dunn (Hon. Sec.), and six visitors.

Best Wheat.—Members considered Steinwedel the best wheat for this district. Different ways of pickling seed were adopted by members; 8 oz. of bluestone to the bag of seed was the strength generally used.

Horse Complaint.—Many horses in the district are affected by coughs, with running from the nose ,and severe scouring. [Mr. Valentine advises changing the food, sponging the nostrils with weak carbolic and water, and giving a handful of a mixture of 10 parts common salt and one part sulphate of iron in a bran mash twice a week.—Ed.]

Rabbit Destruction.—Members reported that strychnine on sandalwood, or box bush twigs had proved very effective. A teapsoonful of strychnine ground fine is mixed with a tablespoonful of flour and a little sugar to a thin paste and painted on to the twigs.

Caltowie, February 9.

Present—Messrs. Hewett (chair), Potter, Kerr, Both, McCallum, McDonald, Jettner, Neate, Graham, J. G. and F. Lehmann (Hon. Sec.), and six visitors.

Fallowing.—Mr. McDonald read a paper on Tillage. One of the most important factors to success in farming is the tillage operations. In the early days it was possible to grow good crops year after year under very perfunctory methods of cultivation, but circumstances had materially changed, and today the farmer who neglects to till his land in a thorough and systematic manner cannot hope to succeed. The system of ploughing up and recropping stubble laid is rapidly losing ground; experience having proved it to be unremunerative. Fallowing is regarded in most districts to be essential, and it is of importance that this work should be done to best advantage. Fallowing operations should be started directly seeding is finished, and should be pushed on with all the strength available so long as the ground is in a suitable condition for working. Spring fallowing was a mistake; it was usually practised with a view to saving the so-called waste of feed resulting from early fallowing, but this loss of feed was more than compensated for by the advantages derived from the fallow being exposed to the winter rains. Probably the point upon which there was most room for debate, was the best depth to plough. This must be determined in a great measure by soil and situation. Shallow scratching of the soil is not profitable; the land should be turned right over, and sufficiently deep to bury all the weeds. Let the soil from the bottom of the furrow be turned to the top, but where there is a good clay subsoil at comparatively shallow depth care must be taken not to bring too much of this to the surface. An attachment to the plough that will stir the subsoil to a depth of 3 or 4 in. in the furrow might be utilized with advantage. In some localities there was a disposition amongst the best farmers to plough about a quarter or half an inch deeper each year, bringing a litte of the subsoil to the surface, where it is ameliorated by atmospheric action. This practice of adding each year a little new soil to the surface might with advantage be tested in this district. After-working of the fallows will consist in surface cultivation, to destroy weeds, and to prevent so far as possible the loss of moisture by evaporation. Only fallow land should be cropped in the dry areas, and it should have two or three years' rest after each crop. To do this it would be necessary to crop each year only one-third or one-fourth of the area available. Considerable discussion followed the paper, members agreeing in general with Mr. McDonald.

Gawler River, February 6.

Present—Messrs. Badman (chair), H. and F. Roediger, Krieg, Hillier, Winckel, Dawkins, Barritt, Leak, Day, and Bray (Hon. Sec.).

Experiments with Feedstuffs.—A resolution was carried affirming the advisableness of systematic experiments being carried out at Roseworthy College Farm to test the relative values of varous feedstuffs for farm stock.

Pigs.—Mr. J. Badman read a paper on pigbreeding. On every farm there must of necessity be a certain amount of waste material, which could be profitably utilized for pigfeeding. He would advise farmers to breed only from pure-bred stock. The best all-round pig for the farm was the improved Berkshire; it combined size, quality, hardiness, early maturity, prolificness, and ability to fatten. He did not advocate pure-bred Berkshires for pork or bacon, but for crossing and raising pigs for the butcher. Secure a good Berkshire boar and mate him to Yorkshire or Poland-China sows of good size, strong and vigorous. The sows should not be too fat, but must have plenty of food and exercise. If they prove good mothers they will need all their condition to keep up the milk supply. For two or three weeks before they are expected to farrow put the sows in separate sties, allowing them to run out during the day. Have a rail 6 in. from the floor all round the sty about 8 in. from the sides; this will afford space for the pigs to slip under and escape being crushed by the sow. Give the sow all the milk and slops she will consume, but no grain until the young are a week old; then give richer food. Boiled wheat or barley is excellent, and there should be as much variety in the food as possible. The more good food the sow consumes the richer will be the milk, and the more rapid will be the growth of the young. The feeding and treatment after weaning must depend upon what the pigs are wanted for, but if they are to grow rapidly and mature early they must be fed liberally, and be provided with warm, comfortable houses. A few weeks' neglect will counteract all the advantages derived from previous good management. Starving a young well-bred sow may not show any immediate injurious effect on her, but the progeny will certainly suffer. To expect a sow that has been half-starved to produce vigorous, healthy pigs, is as foolish as to expect a good crop of wheat from poor, badly-tilled land. If the sow is healthy and vigorous, and the young pigs properly looked after, they should weigh 60 lb. to 70 lb. each at three months. The farmer must always remember that they grow quicker on a smaller amount of food up to three months than at any later period; during that time the sow provides the greater part of the nourishment required. In regard to the Essex pig, he found that crossing with the Berkshire sow resulted in pigs that will consume, digest, and assimilate the greatest amount of food in the shortest time to produce good flesh. Most of the members held that the Yorkshire would thrive on less food than the Berkshire. It was considered advisable to change the food of young pigs gradually; a case was cited of young pigs being killed by feeding on pollard. Mr. Dawkins advised portioning off a small trough in the sty where the sow could not get it for the benefit of the young pigs.

Saddleworth, February 20.

Present—Messrs. Frost (chair), Adams, Bee, Benger, Daly, Scales, Eckermann, Waddy, Coleman (Hon. Sec.), and one visitor.

Wheat Experiments.—Mr. Coleman reported on results of experiments with 26 varieties of wheat, many of them being comparatively new. The results were severely affected by the poor germination of the seed. Rust, though present in the plots, had no appreciable effect on the returns. "Wessex," "Tardent's Blue X," and to a lesser extent "Plover" and "White Hogan," though all reaped after the heavy rains in December, retain their colour well. The first named wheat, as a rust-resisting, non-bleaching wheat, is useful for either grain or hay. For grain alone "Federation" excels; it is not so suitable for hay. "Ulta," a Russian bearded wheat, from the Central Bureau, has a very dark, small grain; seed was not all good. "Plover," "Rymer," "White Hogan," and "Sussex" are all good.

Variety.	Germination.	Heads on best plant.	Yield per acre.			
			1901-2.		1902-3.	
	per cent.		bus.	lbs.	bus.	lbs.
Federation	91	16	30	12	32	1
Selected	91	14	—		28	18
White Hogan	87	23	—		27	20
Rymer	85	15	—		26	40
Sussex	61	18	—		26	40
Plover	80	16	21	1	25	46
Marshall's No. 3	82	13	27	34	24	35
Purple Straw Lammas	82	15	—		23	10
Tardent's Blue X T's B.	73	14	—		22	8
Bobs	82	18	28	30	22	42
Early Lambrigg X Eden	88	—	—		18	51
Pam	88	—	—		18	45
Wessex	82	10	22	33	18	35
Federation X Skeltie	88	10	—		17	55
Petatz Surprise	68	17	—		17	17
John Brown	82	12	—		17	5
Red Province	62	19	—		16	2
Bordeau	85	18	—		16	15
Bunyip	—	15	—		16	15
Redskin	88	9	—		16	15
Jonathan	67	18	17	42	15	16
L. White Lammas	68	16	23	49	14	35
Field Marshal	64	11	20	26	12	45
Rhodes	82	—	—		12	42
Little John	91	—	—		12	42
Ulta (weevilly)	52	—	—		8	7

Strathalbyn, March 6.

Present—Messrs. M. Rankine (chair), McAnaney, Sissons, Reed, Meikle, W. M. Rankine, Michelmore, Watt, and Cherlton (Hon. Sec.).

Cattle Complaint.—Circular from Council of Agriculture was discussed, and it was resolved that, in the opinion of this branch, the questions are too technical, intricate, and diffuse for farmers to answer, and that the stock inspectors were best qualified to reply to the enquiries.

Seed Wheat.—A long discussion on the merits of large and small grain for seed resulted in the following resolution:—"In the opinion of this branch plump fair-sized grain is preferable to lean, shrivelled seed, and farmers are recommended to select rust-resisting varieties."

Conference.—Resolutions of Officers' Conference and arrangements for forthcoming Conference of Branches at Strathalbyn were considered.

Hartley, February 13.

Present—Messrs. Klenke (chair), Wundersitz, Kutzer, Reimers, Stanton, Sanders, Brooks, J. and T. Jaensch, and Stein (Hon. Sec.).

Best Wheat.—Discussion took place on the best wheat for this district. Several of the members voted for Purple Straw as the best all-round wheat; Dart's Imperial was found by several to give the best returns, while Petatz Surprise and Early Para were recommended by one or two members. It was agreed that the late maturing wheats should be sown first, and the early wheats last. Mr. Wundersitz got his best returns from Purple Straw sown early, Dart Imperial mid season, and Steinwedel last of all. For hay, in addition to Purple Straw, Majestic, White Tuscan, Petatz Surprise, and Early Para, for dirty land, were recommended.

Whyte-Yarcowie, February 21.

Present—Messrs. Hack (chair), Hatherly, Mudge, McLeod, Dowd, Mitchell, Hunt, and Boerke (Hon. Sec.).

Reports.—Mr. S. Mudge forwarded an interesting paper on recent visit to Saddleworth district. Mr. Dowd reported on proceedings of Crystal Brook Conference. Resolutions of Officers' Conference were discussed at length.

Colton, February 14.

Present—Messrs. P. P. Kenny (chair), Riggs, Inkster, M. S. W. Keeny McCracken, Kleeman, Packer, and one visitor.

Wheat Experiments.—Mr. Packer reported on results of experiments with manures supplied by the Department of Agriculture. Concentrated super., 40 lb. per acre, gave a return of 8 bushels, next best result being from 140 lb. mineral super. The unmanured land did not average more than 1½ bushels per acre. Discussion took place on results; also on reports in February Journal of Agriculture, of experiments in other localities.

Golden Grove, February 12.

Present—Messrs. Smith (chair), Ross, Woodhead, McEwin, Angove, Bartle, Milne, Robertson, Mountstephen, Harper, McPharlin, and Coles (Hon. Sec.).

Applegrowing.—Mr. Harper read an interesting paper on this subject. What knowledge he possessed of applegrowing had been gained by practical experience. This experience had been rather costly, mainly owing to having to rectify initial mistakes, due to want of knowledge of the requirements and possibilities of the market. To the beginner there was probably nothing so difficult as the decision as to what varieties to plant and what to leave alone. Temptation to extend the varieties planted assail the grower at every turn Unless he can spare an acre or two for several trees of each of a number of varieties for experiment he can make no greater mistake than to plant a large number of kinds of apples. Although it was quite possible that in 10 years' time he would come to change some of the views he now held, he was quite satisfied that if he were starting fresh to-day he would only plant three or four kinds largely, and small lots of about half a dozen more. Under similar conditions of soil and climate as obtain here—just between the plains and the more humid conditions prevailing further back in the hills, with good soil, apples of many kinds attain the greatest perfection with a minimum liability to disease. Under these conditions he would plant at least a third of the area with Pomme de Niege; all the poorest and driest land would be planted with this variety, as it will grow and bear consistently fair crops of well developed fruit on soils on which many other sorts would be unthrifty at

10 years old, and dead a few years later. Then with Jonathan and Esopus Spitzenburg he would plant another third of the orchard. These varieties will do better on the fresher and moister land. As far as his experience went, the Jonathan planted on an E.N.E. aspect produces earlier, larger, and handsomer fruit than on the opposite slope. The rest of the orchard would be planted to a small number each of Rome Beauty, London Pippin, Dunn's Seedling, and one or two others. There were quite enough kitchen, early, and perishable sorts already planted to glut the local market in normal seasons. With land of a fresh, kindly nature on top and a clay subsoil he would not plough deeper than 6 in.; he found trees planted in soil broken up a foot in depth no better than those on land only ploughed 4 in. The after cultivation should be as light as possible; he would start ploughing about the end of August, when there would be a fair crop of green stuff to plough under. He would harrow occasionally to keep the surface loose, but not to destroy the weeds, as with a good crop to plough under each season the soil would be supplied and kept in a good mechanical condition. He would always prefer to work his own trees, but failing this, would get three- or four-year old trees from a reliable nurseryman. He would choose trees grown under adverse circumstances to be removed to better conditions, as they soon show their appreciation of the change. The reverse was the case with trees raised in rich land and planted out in poorer soil. In pruning he would endeavour to secure good strong leaders as near perpendicular as possible, with the lateral branches pruned fairly hard, and would form the tree on a stem 2½ ft. to 3 ft. high. As far as the codlin moth was concerned, the spraying with arsenical mixtures almost appears to have solved the difficulty, and even with careless neighbours the grower is able to save the greater part of his fruit. He was convinced there was a great future before the apple industry in South Australia.

Mount Compass, March 14.

Present—Messrs. Jacobs (chair), Arthurs, Cameron, Good, Herring, Gowling, Hutton, F. McKinlay, Peters, Slater, Sweetman, and H. McKinlay (Hon. Sec.).

Fallowing Swamp Land.—Mr. Good read a paper on the advisability of winter fallowing swamp lands. The more experience he had of the working of these swamp lands the stronger was his conviction that they would have to practise winter fallowing. Light was life, and it was out of the question to expect land that has lain dormant and sodden for one or more seasons to show the vitality of fallowed land. He had seen very fair returns secured from poor soils by constantly turning the land over and exposing it to atmospheric action. It was true good returns are obtained from some soils without fallow, but they could reasonably expect much better crops if fallowing was practised. On their stiff soils it was almost impossible to get a good stand of onions unless the land was turned up and exposed to the action of the wind, rain, frost, and sun for a few months to secure a fine tilth. Then some of the land gets dry and powdery as the summer advances. It was a mistake to allow weeds or winter fodder crops to grow on this land right up to time for planting summer crops, as the vegetation turned under will not decay quickly enough to allow the soil to consolidate before the dry weather sets in. The result is the moisture is not retained in the soil, and the young plants fail to make the necessary growth early in the season. With this class of soil, also with freshly burnt land, early and deep ploughing is necessary; if a depth of ten to twelve inches cannot be obtained by a single ploughing, the land should be subsoiled. He had noticed that where the centre furrow was thrown up, leaving a ridge of deep, mellow soil, the best onions were obtained, and that the crop tailed off as the ground got shallower. It was necessary for them to grow winter fodder, but it could be managed so that each land should lay fallow for two months. Members generally agreed with Mr. Good, although fallowing has not been practised to any extent here. Members wished to know which was likely to be most beneficial—fallowing swamp land in summer or in winter?

Whyte-Yarcowie, March 21

Present—Messrs. Dowd (chair), Faul, Mudge, Kornetzki, Hunt, McLeod, Mitchell, and Boerke (Hon. Sec.).

Ploughing.—Discussion on depth to plough land took place. It was agreed that in this district 4 in. was on the average deep enough, although some land could be profitably cultivated to a greater depth. Mr. Hunt instanced failure of crop due to the farmer ploughing the land to a depth of 9 in.

Swan Reach, March 14.

Present—Messrs. Baker (chair), Arnold, Hecker, Haase, Zadow, Harris (Hon. Sec.), and three visitors.

Experiments with Manures.—Members agreed to contribute towards the cost of experiments with various manures for wheat, to be conducted under the supervision of the Department. Five experimental plots, each of five acres in area, will be tried, and as manures are but little used in the locality the results are expected to prove of great value. Mr. Hecker stated that for vegetable growing he found a mixture of Peruvian guano and bonedust the best manure to apply.

Norton's Summit, March 13.

Present—Messrs. Cowling (chair), Smith, Bishop, and Osborne (Hon. Sec.).

Wattlegrowing.—Mr. Bishop wished to know best time to plant wattle seed. [Early in the spring; the exact time will depend upon local climatic conditions. —Ed.]

Koolunga, March 12.

Present—Messrs. Butcher (chair), Button, Shipway, Sandow, Jose, Lawry, Atkinson, Pengilly, Noack (Hon. Sec.), and one visitor.

Seed Wheat.—Report by Dr. N. A. Cobb, of New South Wales, on experiments with wheat for seed was discussed. Members generally agreed with Dr. Cobb's conclusions. Two members affirmed that, while shrivelled grain appeared to germinate quicker than plump grain, it did not produce such a healthy plant. Members were unanimous that it will pay to grade seed; also that a uniform grade of seed will produce an even crop, while ungraded seed will give uneven or irregular results.

Rhine Villa, March 13.

Present—Messrs. Payne (chair), Farey, W. T. Vigar, Lewis, J. W. Vigar (Hon. Sec.), and two visitors.

Farmyard Manure.—Delegates reported on proceedings of Mannum Conference, and discussion took place on Professor Towar's recommendation to cart and spread stable manure straight from the stables. Mr. J. W. Vigar questioned the wisdom of this advice so far as this district was concerned; if the manure was spread fresh on the field there was every chance that it would be blown away by the high winds before they could get it ploughed under. He considered it preferable to conserve it in a pit until it was required for use. Mr. Payne stated that at Seppeltsfield he had seen manure stacked in a heap with alternate layers of earth, the heap being saturated with water to prevent fermentation.

Mount Gambier, March 14.

Present—Messrs. Mitchell (chair), Wedd, Barrows, Dyke, Norman, Williams, Clark, and Lewis (Hon. Sec.).

Paspalum Dilatatum.—Some discussion took place on the value of this grass. Mr. Dyke had seeds lie in the ground two years before they germinated, but the plants were doing splendidly. He thought it would be a good grass to grow on the sandy soil that was inclined to drift. Mr. Clark mentioned that in some parts of Victoria it was being planted as a firebreak. [This grass should do well on all but the poor, dry soils in the south-east. Seeds are very unreliable; it will be cheaper in the long run to buy roots and set them out about 4 ft. apart each way.—Ed.] Most of the time of the meeting was occupied in discussing arrangements for the forthcoming Conference.

Holder, March 14.

Present—Messrs. Rowe (chair), Vaughan, Perry, Jones, Jaeschke, Rossiter, Pickering, Starr, Rodgers, and Green (Hon. Sec.).

Wheatgrowing.—Considerable discussion on this subject. Mr. Jaeschke advocated April sowing as best for this locality. Mr. Starr advocated rolling the land, as otherwise the strong winds would cause the light soil to drift.

Wilmington, March 11.

Present—Messrs. Slee (chair), M. and N. Bishof, McLeod, Schuppan, Bauer, Broadbent, Lauterbach, Zimmerman, Payne (Hon. Sec.), and two honorary members.

Poison Plant.—Mr. Bauer tabled pea-flowering plant, which he believed to be poisonous. It was growing in a paddock in which a foal had died showing symptoms of poisoning. [This is a variety of Lotus, probably L. australis, and is reputed to be poisonous at certain stages of its growth.—Ed.]

Early v. Late Wheats.—It was agreed that the late varieties of wheat should be sown liberally in good seasons, but in late and dry years it was advisable that the sowings of early maturing varieties should preponderate.

Congress Papers.—Mr. McLeod read Prof. Towar's Congress paper, and offered some criticisms on same. Considerable discussion ensued.

Bute, March 10.

Present—Messrs. Brideson (chair), A. and H. Schroeter, Ebsary, Hamdorf, Masters, Barnes, Commons, Cousin, Gitsham, Stevens, McEvoy, Sharman, and Trengove.

Tillage Operations.—Mr. Trengove reported on proceedings of Conference at Brinkworth. He was very favourably impressed with Prof. Towar's address on preparation of the soil for seeding, and believed that, where drifting of the soil had not to be contended with, the adoption of the methods advocated would result in better crops being secured in dry seasons than has been the case during late years.

Oats.—In reply to enquiry as to most profitable variety of oats to grow in this district, Scotch Grey was generally favoured. In pickling to prevent smut, most of the members use bluestone with satisfactory results. For wheat pickling most of the members use 8 lb. of bluestone in 1½ gallons of water to the bag of wheat, but several members used only a gallon of water. Mr. Masters wished to know how oats were pickled at Roseworthy College Farm. [Both the bluestone and the hot water treatments have been used, the latter being undoubtedly the better for oats.—Ed.]

Kapunda, February 7.

Present—Messrs. Shannon (chair), Kerin, O'Dea, Flavel, Teagle, Correll, Holthouse, Weckert, Pascoe, and Harris (Hon. Sec.).

Deep Cultivation.—Mr. Correll read a paper advocating deeper cultivation of the soil. Where the nature of the subsoil did not permit of deep ploughing it should be broken in the furrow with a subsoil attachment. The majority of members favoured only medium depth of cultivation, depending upon the nature of the soil.

Mundoora, February 16.

Present—Messrs. Harris (chair), Blake, Beck, Shearer, Angley, Mitchell, Mildren, Aitchison, Allen, Button, Tonkin, Gardiner (Hon. Sec.), and three visitors.

Koppio.—Mr. Gardiner reported at length on recent visit to Koppio District, and tabled samples of soils, grains, and other products of the district. He was very well pleased with the land, and was sure that, with proper cultivation, it would support a prosperous community. Farming in the district was yet in its infancy, still very good crops were grown in different parts. Mr. Angley reported on proceedings of Crystal Brook Conference.

Mount Bryan East, February 21.

Present—Messrs. Dunstan (chair), Quinn, Teddy, Pohlner, Dare, Taylor, T., and E. S Wilks (Hon. Sec.).

Oats for Fowls.—Mr. Pohlner stated that he preferred oats to wheat for fowl feed.

Harvest.—Owing to the dry season yields generally were very poor; members estimated the average for the district at 1½ bushels of wheat per acre. The total rainfall from April 1 to October 31 was only 8.6 in. in the most favoured parts. Owing to the patchy character of the rain portions of the district had considerably less.

Buckbush.—Members reported that some of the farmers were cutting the buck bush, or "rolly polly," for feed; when dried, stock do well on it.

Kingston, February 7.

Present—Messrs. Pinches (chair), Clarke, Fraser, Pinkerton, Barnett, Goode, Thredgold, Cooper, Flint, and Wight (Hon. Sec.).

Licensing Stallions.—Discussion on this subject took place. Mr. Pinkerton would tax all entire horses; there were far too many mongrels sent to market now, and many of the stud horses used are absolutely unfit. Then the mares in many cases were inferior. To keep a real good entire as he should be kept cost money; more than a good many farmers are aware of, and in the interest of his horse the owner of a first-class animal should refuse to accept any mares that he did not consider suitable. Stud horses were too frequently blamed for the poor stock they get, when the mare is largely the cause. Breeders should be prepared to pay a reasonable fee, and encourage those buying first-class entires. Many mares were sent to inferior horses because the owner accepts a smaller fee. Mr. Goode pointed out that they had plenty of evidence that it was profitable to put good, roomy mares to a first-class horse. Nine horses bred by Tregeagle in this way had averaged £34 each. The majority of the members thought there was a great deal of truth in the saying that "most of the breed goes in at the mouth."

Fodders.—Mr. Good tabled Italian Rye Grass, 2 ft. high, and lucerne 30 in high. Both were grown on the edge of Biscuit Flat without irrigation, the lucerne being nine months from sowing. Mr. Pinkerton tabled Johnson grass 3 ft. 6 in. high.

Forest Range, February 17.

Present—Messrs. Monks (chair), Vickers, A. H. J. and R. Green, Waters, Gunn, Rogers, McLaren, F. Green (Hon. Sec.), and one visitor.

Humus.—Mr. Monks read a paper on this subject. Humus was decayed organic matter, and played a most important part in the fertility of the soil. According to the plants from which it was derived the humus would be rich or poor in plant food. As gardeners the question of how best to keep up the supply of humus was of great importance. He frequently heard people boast that they never allowed any weeds to grow in their gardens. Such people were apparently ignorant of the fact that by this continuous cultivation they were preventing the natural replenishing of the constituent which the soil so badly needs. Athough he could never have made such a statement as that referred to, he was convinced that he had been keeping his land too clean, and instead of destroying the weeds it would have been better to have let them grow, and also put in other crops to plough under. It was possible to considerably improve the condition of their orchard soils by allowing the weeds to make a fair amount of growth before turning them under. If the natural growth was not sufficient they would have to sow peas, clover, vetches, or some other crop for the purpose, and where necessary it will pay to apply a light dressing of commercial fertilisers to force or encourage the growth. Probably they could not do better than sow peas in June and turn them under not later than October or, in favourable seasons, in the beginning of November. His reason for recommending peas was that they were more easily and cheaply grown than most other leguminous plants, and they could rely on getting a good growth. Considerable discussion ensued, members generally agreeing with the Chairman on the necessity for ploughing under vegetable matter to replenish the supply of humus and improve the physical condition of the soil.

Arden Vale, February 16.

Present—Messrs. Warren (chair), Eckert, Willis, Pearce, Starr, Schutloffel, Hannemann (Hon. Sec.), and one visitor.

Harvest Returns.—The hon. secretary reported that, owing to the drought, only about one-sixth of the area sown in the hundreds of Yarrah and Wyacca were reaped, and the yield from this portion averaged just over half a bushel per acre.

Roseworthy College.—Mr. Schutloffel reported on visit to the College. Members generally thought Professor Towar's suggestion for short courses of instruction for farmers a good idea.

Cocky Chaff.—Mr. Pearce read a paper on construction of sheds for cocky chaff. If he had the money he would construct the sheds with stone for walls and iron roof, as he was convinced that they would prove profitable in the end. Money being scarce, owing to the severe seasons passed through, he would, however, have to be satisfied with something less expensive. His plan would be to have a straw-covered roof and wirenetting sides. First of all they would need to get a supply of good shed forks. This should be done when post cutting, as the forks can be selected then at leisure and allowed to dry before being used. Fairly straight pieces for bearers should also be selected. For rafters almost any straight timber would do. He would erect the sheds north and south, not more than 18 ft. wide, first scooping out the ground to 2 ft. to 3 ft. to give extra storage. The centre of the shed should be 12 ft., and the sides 8 ft. above ground level. The distance between the forks should not be more than 12 ft. In putting in rafters see that a good stiff one is put every 4 ft., with lighter sticks in between. To support the netting put a light pine between the forks. Stack the straw for the roof in the summer, and put it on during the winter when damp. Secure the straw with wire or wirenetting. The shed can be added to each year as time permits, until they had a large enough store for all the chaff and straw they could save in the best of seasons. The sides can be filled where stone is plentiful by degrees, taking the south and west sides first, as most rain comes from these directions. To make the shed secure, it is a good plan to put a fair depth of concrete round each post. Where limestone is plentiful this will only cost labour. To show the value of straw for food, he might mention that he used up the roof of one large shed last winter and saved all his stock. At the present time he was using the straw roof of a large stable. There was about a dozen large wagon loads of straw available. For ten working horses he was using 100 lb. daily of good hay chaff each morning, and at night straw damped with salt and water. He found the young stock took very readily to this, all the leavings being greedily devoured by them. In this district, where the Acacia bush was plentiful, straw seemed to be of far greater value for stock than where it had to be used alone. He found that the straw on the shed roof of more value than that kept in stacks not thatched, being sweeter and less liable to rot. Members generally agreed with Mr. Pearce, but thought it was a mistake to scoop out an excavation, as suggested, as the moisture in wet seasons would spoil a lot of chaff.

Port Pirie, March 7.

Present—Messrs. Johns (chair), Williams, Humphris, Lawrie, Wright, Hannan, Spain, Jose, and Wilson (Hon. Sec.).

Quantity of Seed Per Acre.—The hon. secretary read from Journal paper written by Mr. W. H. Hawke, of Arthurton (page 151, Sept. 1901) on the quantity of seed to sow. A good discussion ensued, members agreeing in the main with Mr. Hawke.

Feeding Values of Early and Late Wheats.—It was agreed that the later maturing wheats produced the most feed, and also stood feeding off better than the early varieties. The stubble of the late wheats was preferred by stock, and members regarded this as an indication that the hay was also of better quality.

Fodder Plants.—Mr. Hannan had been successful with irrigated lucerne. The Chairman stated that, although stock would not touch the first plants of tree lucerne he grew, the shoots on seedlings from the original tree were readily eaten by both horses and cattle. Mr. Lawrie found sheep eat the foliage of the African box thorn, while turkeys fatten readily on the fruits. Long red mangels would pay to grow. Sown in June they did well with him.

Booleroo Centre, March 10.

Present—Messrs. Nottle (chair), Arthur, Albinus, Michael, Dr. Steven, Brooks, Miller, McMasters (Hon. Sec.), and nine visitors.

Successful Farming.—Mr. Arthur read a paper on this subject. One of the essentials to successful farming was the provision of a plentiful supply of hay for the horses. Unless the horses were well fed it was impossible to work the land as it should be worked. In the drier districts only fallow should be cropped. A few sheep should also be kept. Not only do they provide meat for the house and help to keep the land clean, but there is a welcome addition to the revenue from wool, skins, and lambs. If he were starting farming on a new place he would wirenet in order to be able to keep crossbred sheep, which were now more profitable than merino. Mr. Brooks also thought it a mistake to put six-wire fences for sheep when they could wirenet at little extra cost. Members generally agreed that it was best to crop only fallow, and to cut a good supply of hay. Some thought wirenetting too expensive, and not necessary. One member would keep fewer horses and feed them well in order to enable them to get through the work. A visitor thought it worth keeping a few extra horses in order to get the fallowing finished as early as possible.

Naracoorte, February 15.

Present—Messrs. Schinckel (chair), Duffield, Anderson, Wynes, Buck, Wardle, Caldwell, and Forster.

Hon. Secretary.—Mr. A. Caldwell was appointed Hon. Secretary.

Potato Experiments.—Mr. H. Buck reported on the results of experiments with potatoes supplied by the Chairman. He put in 10 lb. of each on July 24. Professor Maercker yielded 86 lb., Thiel 50 lb., and Ehlers 54 lb. The season had been altogether too dry for them. Maercker gave the best results, but there were too many small potatoes. Mr. J. G. Forster tried the same varieties, but they had not done so well as the red skins, which were planted and dealt with similarly. He found Professor Maercker the most prolific but there were too many small potatoes. He showed specimens of the red skin variety of potatoes which he had grown with second crop. The potatoes of both crops were of good size and quality, but the second crop was the best. He attributed the success of the second crop to the summer rains.

Farmyard Manure.—The Chairman read a paper on the care of farmyard manure. The quality of farmyard manure will depend upon the animals from which it is derived, the feed they get, and the care that is taken of the manure. The dung is comparatively rich in phosphates and potash, while the urine contains a larger percentage of nitrogen. It was important that the liquids should be saved as well as the dung itself. It was necessary therefore to put straw or other litter in the stables and yard to absorb the liquids. The best way to use the straw was to allow the stock to tread it in. The yards and stable must be cleaned frequently, otherwise the animals get very dirty, and there is also a loss of valuable constituents. As the manures of different animals varied in their constituents they should be mixed in the heap or pit. Horse and sheep manure have a tendency to become heated in the heap; pig and cow manure are not so liable to this danger. By mixing them together there will be less likelihood of loss from heating. It was advisable to keep the manure in a pit—not necessarily a deep one—where the liquids from the stable can be drained. Where the manure cannot be conserved in this way it will be better to apply it to the land as it is made, and not keep it for any length of time in the summer in the heap. Some difference of opinion existed as to the value of pig manure. The Chairman pointed out that this would depend on the feeding and treatment of the pigs. Mr. Forster considered it more profitable to buy commercial fertilisers than to make and spread stable manure.

Wheat Experiments.—The Chairman secured 21 bags of clean wheat from 4½ acres of Gallant wheat. Oats did not do as well as expected, yielding only 20 bushels per acre. Mr. Forster stated that at Morambro wheat manured with 1 cwt. of super per acre averaged 22 bushels. off 100 acres. He got 160 bags off 50 acres, using 75 lb. of super per acre; the unmanured land yielded only half a bag per acre. Mr. Duffield got 17 bushels per acre, using 80 lb. Thomas phosphate. Mr. Buck applied 48 lb. super per acre to sandy soil, and harvested 10 bushels to 12 bushels; on the unmanured land the crop died off. Several members reported less yields where heavy dressings were applied, compared with returns from light dressings of super, and attributed the result to the dryness of the season.

Golden Grove, March 12.

Present—Messrs. Smith (chair), Maughan, McPharlin, Woodhead, McEwen, Rawlins, Milne, and Coles (Hon. Sec.).

Apple Growing.—Mr. Harper's paper, read at previous meeting, was discussed. Mr. Maughan found the Cleopatra do well on the best of soil. It paid to keep the orchard clean and free from weeds. One of the most successful growers in his neighbourhood always had the harrows going after rain in spring and summer. Mr. Maughan spoke very highly of the results of spraying with arsenite of soda in his garden on the departmental test block. He was satisfied that had no rows been left unsprayed as check plots he would have saved 98 per cent. of the fruit.

Kanmantoo, March 13.

Present—Messrs. Lehmann (chair), Mills, Hawthorne, Hair, and Downing (Hon. Sec.).

Lucerne.—The Chairman initiated a discussion on lucerne growing, giving the members the benefit of his experience. He found that with a retentive soil lucerne only required one watering during the summer; but it must be a thorough soaking. Under such conditions he had grown 4 ft. of lucerne in 40 days.

Potatoes.—The Hon. Secretary tabled samples of new varieties of potatoes grown from setts received from the Bureau, viz., Thiele, Professor Maercker, and Gratia. The last was the best, and resembled the redskins. Owing to the setts being put in late, and the season being unfavourable, the results were not a fair test. The yields, however, compared favourably with the kinds usually grown.

Eudunda, March 9.

Present—Messrs. Gosling (chair), Paech, Pfitzner, Weil, Martin, Kluske, Bertouch, Hucks, and Marshall (Hon. Sec.).

Melons.—Mr. Kluske tabled watermelons and pumpkins grown without the aid of irrigation. He has 20 acres under crop with different kinds of melons, which are doing well.

Sheep.—The Hon. Secretary read a paper on "Sheepbreeding for small stock owners." For their locality the merino was most profitable, as the wool sells well, and the sheep are hardy and good doers. Where early lambs are required select the ewes and mate them before shearing; but under ordinary circumstances, when purchasing ewes, it is better to wait two months after shearing, as by that time they will have grown enough wool for one to be able to judge fairly well of the character of fleece likely to be produced. The wool could not be too dense; open fleeces were a great mistake in the hot, dry districts. In buying a ram, get a good one. A good ram at £10 is far cheaper than an inferior animal at a quarter of the money. The ram was practically the foundation of the flock. From a good ram and fairly good ewes you will rear good ewes to breed from later on. The ewes should not be kept after they are 6 or 7 years old. Good breeding and good feeding go hand in hand. Nothing shows the effect of inferior food so quickly as wool. Lambs on grass land should be shorn before the wool gets full of grass seed. On scrub country this was not necessary. While they might do well with crossbred sheep, they must bear in mind that it was a mistake to go beyond the first cross. Salt should be provided for sheep unless on naturally salt country.

Mount Remarkable, March 12.

Present—Messrs. Jorgensen (chair), Foot, Yates, McIntosh, Casley, and O'Connell (Hon. Sec.)

Tonic for Horses.—The Hon. Secretary called attention to recommendation in The Australasian to give to each horse a tablespoonful of a mixture of 3 lb. salt and 1 lb. sulphur once a day in the feed. All the members believed in feeding salt to horses; some mixed it dry with the food, others dissolved it in water and damped the food.

Maize Crop.—Mr. McIntosh showed a cob of maize grown by him; from a small plot he had got equal to 50 bush. of maize per acre.

Dairying.—Mr. Casley read a paper on "Dairying—the Old Style and the New." With the teachings of the present day dairying experts on "germs" and "bacteria" in mind, one wonders how it was that the old-fashioned dairymen ever managed to live to such advanced ages as many did; consuming so much and so varied an assortment of germs in the milk and butter, they should never have reached healthy old age. While not in any way advocating the old system in preference to the new, it was undoubted that many dairies turned out first-class samples of butter under the old system. Under present conditions a suitable locality was one of the first essentials to success in dairying. Next comes the selection of the best class of cow for the particular locality; what will suit one district will not necessarily do best in another. The test of quality should not be looks, but the actual butter production. A cow that will produce profitable quantities of milk for eight or ten years is entitled to decent burial when past good service, and the question of her value to the butcher is not worth consideration. First-class food and a good water supply are also necessary. The frequent neglect to avail themselves of the opportunity of growing feed for their cows is the stumbling block of many farmers. The little extra labour involved is amply repaid in the extra profits. For every pound sterling judiciously spent in growing and conserving food at least two pounds can be relied on in the returns from the dairy. His experience in this locality was that the progeny of a Jersey bull mated with Shorthorn or Ayrshire cows was the best. As good Shorthorn milking cows were scarce, the Jersey-Ayrshire cross was most reliable. Any large framed cow that was a good milker, even if she was only a mongrel, he would cross with the Jersey. The successful dairyman must have his cows come in in rotation, and must keep them in good health. Impaction or dry bible will not trouble the dairyman who grows green fodder and makes ensilage for them. If medicine is required, raw linseed oil, Epsom salts, and carbonate of soda will be found useful. The cows should be frequently examined to see that they are all right. Half a pint of raw linseed oil once a fortnight will greatly assist in keeping the animal in good health, and can do no harm. Do not give any kerosine. Housing and milking play an important part in the management of the dairy. Milking should be done regularly, and every care should be taken to prevent the cows being driven or worried by dogs. Milking should be done quickly and thoroughly. The udder should be brushed first, and cleaned with warm water. Cleanliness in the dairy must be observed. Provision of shade and shelter, especially in the winter, was essential. Cows that are fed before milking should be under some sort of shed with bails, and a manger from end to end, and a passage way 5 ft. to 6 ft. wide at the back to facilitate feeding. Sheds should be open to the east and be paved, with provision for drainage to a catchpit. After each cow is milked, the milk should be at once strained into a can protected from dust. The milk should, if possible, be separated before the animal heat has left it. If this cannot be done it should be warmed before being separated. The cream should be kept in a cool, clean place until disposed of.

Stockport, March 14.

Present—Messrs. Watts (chair), Stribling, Thomas, Megan, Perry, Smith, Howard, Branson, Hartnett, Murray (Hon. Sec.), and one visitor.

Sheep Farming.—Mr. S. Kelly forwarded a paper on this subject. He considered the keeping of sheep essential to success in farming. The question most at issue was the kind of sheep most profitable to the farmer. It was true that with good judgment in buying, and a little luck in addition, much money can at times be made by buying store wethers and selling them when fat. Taking all things into consideration, the breeding of lambs will on the whole pay best. To get the best results they must breed for both wool and mutton. The ewes should be good, well-framed merinos; they should be well woolled, and kept as such. It was a mistake to fill up vacancies in the flock caused by culling with crossbred ewes, as the wool will soon fall off. Although the fineness of our merino wool was at one time of world-wide reputation, there had of late years been a tendency to grow stronger wool, which, although not realising quite so much per pound as the fine wool, approached more closely in value than was the case ten years ago. They must also remember that the strong fleece accompanied a larger carcase and a stronger and healthier constitution. Culling should be regularly practised. It was better to sell a ewe a year too soon than a year late, as if sold before her mouth is broken she can be fattened or sold at good store price. For lambs these merino ewes should be put to Shropshire or Dorset horn rams.

Quorn, March 14.

Present—Messrs. Thompson (chair), Rowe, Cook, Herde, Patten, Toll, Walker, Brewster, Smith, Noll (Hon. Sec.), and one visitor.

Farmyard Manure.—Mr. Rowe initiated a discussion on the use of farmyard manure for wheat crops in this district. It was unanimously agreed that the manure should be carted out and spread on the poorer patches of soil to be found on every farm; but members differed as to whether it was better to rot it in a heap or pit, or cart and spread it fresh from the stable and plough it under. Most of the members favoured the latter practice.

Forest Range, March 12.

Present—Messrs. Vickers (chair), Townsend, A. H. and J. Green, McLaren, Gunn, Waters, Rowley, F. Green (Hon. Sec), and one visitor.

Apple Pest.—Mr. Rowley showed specimens of grub which attacks the roots of the apple by eating the bark. In time the tree succumbs to the attack.

Disposal of Fruit.—Mr. E. Rowley read a paper on the disposal of jam fruits. A large number of what were known as "jam fruits" were being planted each year, and he thought the growers would do well to use their brains, and consider how best to dispose of the fruit after it was grown. The present method was very unsatisfactory to the grower. There were only a few large buyers of jam fruit, and when there was a fair crop of any one kind, they put their heads together and fixed the price, knowing that most of the fruit must pass through their hands. The grower can do nothing but accept the price offered, however small. He thought that too many of the growers concentrated their energies on growing as much stuff as they can, and until the crops are gathered give little thought as to the marketing of the produce. The consequence is that buyers or middlemen give just as little as they can, and although many growers criticise their actions, it was unreasonable to blame the buyer for getting his requirements as cheaply as he can. The real fault lay with the grower. The prices given for some fruits this season has been enough to cause them to consider seriously whether the present system could not be improved, and uniform and satisfactory prices secured. To get this the growers must deal more directly with the consumer, who, as a rule, profits little from the low prices paid to the grower; in fact, while the latter is suffering, many of the would-be consumers have but little chance of getting fruit at a reasonable price. There was, in his opinion, plenty of room for all the produce they could raise, provided some system of distributing it at a reasonable price could be adopted. He advised co-operation and support to the depot already established. The company should erect a factory to make jam or preserves, or in some other way utilize the surplus fruits. They could ascertain the likely yields in this and the other States, and fix a reasonable price to the buyers. Agents should be secured in all centres of population, and efforts made to open up new markets for both fresh and preserved fruits. It was imperative, however, that the depot and its agencies should be carried on as economically as possible. It would be run on charges merely sufficient to pay expenses; big profits on the handling of the fruit will result unsatisfactorily to the grower. If the growers would only work together in this way they would receive on an average 25 per cent. more for their produce, while the consumer would pay less than he does at present. The paper was well discussed, and a resolution in favour of the scheme outlined was carried.

Cherry Gardens, March 12.

Present—Messrs. C. Lewis (chair), J. Lewis, Jacobs, Paltridge, Brumby, Hicks, Potter, Burpee, Gardner, and Ricks (Hon. Sec.).

Cattle Complaint.—Considerable discussion on impaction in cattle took place. Members reported that cattle fed under totally different conditions appeared to suffer equally; those receiving green feed regularly being affected in a similar way to those on dry food.

Wandearah, March 9.

Present—Messrs. Robertson (chair), W. and R. Roberts, E. H. and J. H. Eagle, Dick, Monday, Davidson, and Birks (Hon. Sec.).

Hon. Secretary—Mr. J. H. Eagle was appointed Hon. Secretary, vice Mr. C. E. Birks, who tendered his resignation.

Fallowing.—Mr. Roberts referred to Professor Towar's suggestion to roll the land after ploughing. He did not approve of the practice in some soils. A member pointed out that what the Professor advised was that the farmer should endeavour to at once bring the lower portion of the ploughed land in contact with the bottom of the furrow, at the same time keeping two or three inches of the surface loose to prevent evaporation of moisture. In some soils rolling after ploughing and then harrowing might not be necessary, but it was the principle that should be grasped. The farmer would have to decide for himself how best to bring about the desired end. Considerable discussion took place on feeding off weeds on the fallow as against the use of the cultivator to clean the land. Most of the members seem to favour the latter practice, to prevent the growth of weeds, which must remove some moisture from the land.

Kingston, March 7.

Present—Messrs. Pinches (chair), Redman, McBain, Clarke, Pinkerton, Flint, Fraser, Barnett, McCulloch, and Wight (Hon. Sec.).

Irrigation.—The Hon. Secretary tabled some well grown mangolds, carrots, and parsnips. They were grown on poor sandy country with the aid of water and manure, and showed that this land was possessed of greater possibilities than was generally recognised. He strongly urged members to irrigate small plots on their farms, even if they had to commence in a haphazard way. Mr. Redman stated that on half an acre he had produced 2 tons of potatoes and 12 tons of mangolds.

Stallion Tax.—Mr. Redman initiated discussion on this subject, favouring the imposition of an annual tax on entire horses with a view to improving the breed of stock. Several members agreed, but by a majority of two votes a motion in favour of the proposed tax was defeated.

Saddleworth, March 20.

Present—Messrs. Frost (chair), Adams, Benger, Daley, Eckermann, Hannaford, Heaslip, Leeder, Neill, Plant, Scales, and Coleman (Hon. Sec.).

Sheep and Wool.—Mr. G. Jeffrey, in a recent address given by request of this branch, dealt with this subject. For fat lambs for market use big-framed merino ewes. Merino wool did not fluctuate like crossbred; it was always saleable. Such ewes were easily procurable, had proved suitable for this climate, and of good constitution. Use Dorset Horn, Shropshire, or South Down rams. The earlier the lamb fattens the better the meat and the quicker the return. If woolgrowing is to be the main object, select large-framed sheep; size often indicates constitution. Density of wool was very important. Aim at fair length of staple packed in close, with plenty of crimp or wave-like appearance; if plain—that is, lacking in character—the quality was lost and then the quantity. Aim at best price per pound for the wool. Put up fleeces to look nice—an attractive clip creates confidence and encourages competition. Don't mix locks and fleece; avoid small lots, as these are neglected by larger buyers. Roll the fleeces, do not tie; cull out inferior, and keep the bellies apart.

Adoption of Rules.—Those suggested by the late Central Bureau were formally passed, except clause 2 of membership, which shall read as follows:—"Any member absent from two consecutive meetings shall be struck off the roll unless he offers a valid excuse in writing at the next ensuing meeting."

Horses on the Farm.—Mr. W. Hannaford advocated farmers rearing their horse stock; it would pay well at present prices. Most members favoured this. Heavy draught horses of the Clydesdale class were preferred by some, but the majority liked a lighter, more active horse of the spring dray or tram horse type. Members would work their mares up to time of foaling, otherwise the mares were liable to get too fat. Young draught stock were generally broken in at 2½ years. At that age they developed best, and were handled with less risk.

Machinery on the Farm.—A short paper was read by Mr. W. E. Leeder, and generally approved by members. The locally made light stump-jump ploughs were good, and hard to beat. Harrows should always have cross bars on top to give more clearance. Roller, if ribbed with T-iron, was improved for breaking down rough land, instead of simply pushing the clods down flat. The spring-tooth cultivator was very useful, and left the surface level yet loose, but did not take the place of a scarifier altogether; medium width machines the best. They had not done with the stripper yet by a long way, but the combined harvester is coming quickly into general use, especially on level country. The farmyard manure spreader should be more generally used. They could not afford to neglect the farmyard manure, and this specially constructed wagon carts out and distributes the manure evenly and in a broken up form. In the discussion many different machines and makers found supporters. A difference of opinion was noted as to the merits of Dunn's patent addition to the winnowing machine by those who had had the alteration or bought new machines with patent in.

Kapunda, March 11.

Present—Messrs. Holthouse (chair), Banyer, Kerin, Teagle, Pascoe, Weckert, Flavel.

Stock Complaint.—Discussion on circular from Council of Agriculture took place. Mr. Teagle had three cattle attacked. He gave one 2 oz. salts, 2 oz. nitre, 1 oz. turps, and 3 pints linseed oil, in two doses, and saved her life. The other two died, and on being opened he found the stomach full of a hard dry substance. The animal that recovered died about 12 months later, under similar circumstances. The Chairman stated that he kept a scrapbook containing notes of recipes and other information, and in it he had a tonic suggested by the Central Bureau some years ago. This was to give 1 lb. to 2 lb. Epsom salts and 2 oz. each of gentian and ginger in a quart of warm water, then follow with a tonic of 1 oz. each of liquid ammonia and essence of ginger in a quart of warm ale. Whenever his cows were at all dull he treated them accordingly, and had never had a failure. A little sulphate of iron should be given occasionally, and rock salt where the cattle can help themselves. Several members instanced losses due to cattle eating too much dry feed, such as straw, cocky chaff, &c.

Mundoora, March 13.

Present—Messrs. Blake (chair), Mildren, Mitchell, Angley, Shearer, and Gardiner (Hon. Sec.).

Manures and Implements.—The Secretary reported on visit to Wallaroo Phosphate Works, and to Martin & Co.'s and May Brothers' implement works at Gawler. He also inspected Messrs. Darling & Son's produce works, which were very interesting to farmers.

Weeds.—Members called attention to rapid spread of certain weeds of recent years in this district.

Brinkworth, March 13.

Present—Messrs. McEwin (chair), Shepherd, Russell, Coombe, Welke, Stott (Hon. Sec.), and one visitor.

Pickling Wheat.—Discussion on this subject took place. The Chairman sowed without pickling in dry ground, but used 8 oz. of bluestone to the bag of wheat when the ground was moist. Mr. Shepherd had used arsenic and bluestone, both being efficacious. Members generally advocated dipping the seed in the pickle in preference to pickling on the floor.

VENTILATION OF FACTORIES AND WORKROOMS.

Contributed by the Chief Inspector of Factories.

(Continued from page 528.)

II.—Impurities from Lights.

An ordinary gas jet, such as is commonly met with at present in English factories and workshops, consumes from 5 to 10 cubic feet of gas per hour; and this amount of average English gas produces in burning about 2½ to 5 ft. of carbonic acid, along with 5 to 10 ft. of aqueous vapour, and consumes about 5 to 10 ft. of oxygen. The mean of two analyses by one of us of ordinary 16 to 17 candle power gas gave the folowing results per volume of gas burnt:—

Carbonic acid formed	0.54 volumes.
Aqueous vapour formed	1.19 volumes.
Oxygen consumed..	1.14 volumes.

As the aqueous vapour does not under ordinary conditions condense, the products of combustion are (apart from heating) lighter than ordinary air, for, although the carbonic acid is about 37 per cent. heavier than the oxygen which it replaces, the aqueous vapour is about 42 per cent. lighter, and present in much greater quantity. The mistake is often made of regarding air vitiated by the products of combustion as heavier than pure air. Roughly speaking, an ordinary gas jet produces as much carbonic acid as three men, and as much heat as five men. The combustion is quite perfect, and no carbonic oxide is given off, unless from any cause the flame is smoky, or is rapidly cooled by something in contact with it.

Were there no other products of combustion but carbonic acid and moisture, the changes produced in the air of rooms by burning of gas would be of little practical importance apart from the rise of temperature. Lighting gas, however, contains not merely carbon and hydrogen, but also a little sulphur, chiefly in the form of carbon disulphide. This sulphur is burnt chiefly to sulphuric acid, which is the cause of the characteristic unpleasantness of air which is much vitiated by gas. The quantity of sulphur present in gas varies considerably in different towns according as the gas is or is not thoroughly purified. In London, where the purification is good, and there is a legal limit to the amount of sulphur permitted in the gas, about 12 grains of sulphur per 100 cubic feet of gas are usually present; but in some of even the larger English towns, the amount of sulphur present may be much higher, so that the air becomes correspondingly more unpleasant when vitiated by burning gas. Air vitiated by gas jets to the extent of 20 volumes of carbonic acid per 10,000 begins to feel distinctly oppressive, even with well purified gas. In air vitiated to the extent of even as much as 75 volumes of carbonic acid by a good and clean paraffin lamp we could observe no similar effect.

The relative increase of air vitiation in any given workroom after the gas is lit will evidently vary with the proportion of gas jets to persons present. This proportion differs very greatly in different workrooms. Where there is much machinery or floor space to each worker the number of gas jets may greatly exceed the number of workers. Thus in spinning rooms (Appendix 1, Table 0) there are often three or four jets to each person; consequently the production of carbonic acid after gas is lit may rise to 10 or 12 times what it was during daylight. On the other hand, in the more crowded rooms where sewing, &c., are carried on, there may be only about one jet to two or three persons (Tables A to D), so that the production of carbonic acid is only about double after gas is lit.

In view of these facts, the effects of burning gas on the state of the air in any room ought always to be considered in connection with the means of ventilation. When the heated air from gas jets has prompt means of escape above, the actual vitiation of air at the breathing level may not be much increased. But when the air at all levels is allowed to mix before escaping, or is kept in mixture by belts from shafting in the roof or other causes, the effect of burning gas on the purity of the air is often very great.

By the use of incandescent electric light all the inconvenience due to air vitiation and heat from gas jets can be avoided, though the extra expense as compared with incandescent gaslight is considerable. The arc electric light, so shaded that only reflected light falls on the employes and machines, is in some cases very advantageous.

The most wasteful methods of burning gas are still very commonly used in factories and workshops, in spite of the greater expense and increased vitiation of air. Much improvement could certainly be effected by increased attention on the part of the employers to improved methods of lighting. The most suitable methods will vary according to a number of circumstances, and skilled advice on the subject should be obtained when necessary. The heated air containing the products of combustion of a gas jet passes straight up to the roof in a concentrated stream. It there parts with most of its heat, and unless it is permitted to escape is slowly displaced downwards again, to be again partially carried up by the flame. As, however, gas jets are usually placed at 6 ft. or more from the floor this circulation of hot and vitiated air is to a large extent above the breathing level, so that the air actually breathed is not so much vitiated as would otherwise be the case.

(To be continued in next issue.)

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of persons registered and found employment by Government Departments and Private Employers from January 30 to March 28, 1903.

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths	176	368	615
Carpenters	8	1	7
Masons and bricklayers	5	1	4
Painters	12	—	6
Boilermakers and assistants .. .	1	—	19
Blacksmiths and strikers	8	—	6
Fitters and turners	7	1	3
Moulders	3	—	12
Coppersmith	—	—	1
Brassfinishers and improver	—	—	2
Electrical Wiremen	3	—	6
Sculleryman	—	—	1
Warders	1	—	—
Apprentices	15	7	3
Cleaners	5	3	—
Porters and junior porters	14	7	2
Rivet boys	2	—	—
Fettlers	—	—	1
Ironworkers and plumbers	2	—	1
Tile layers	—	—	3
Shipwright	—	3	2
Jointers	—	1	4
Gardener	—	—	1
Attendants	—	—	2
Engine drivers and firemen	1	3	1
Totals	263	395	702

March 30, 1903. A. Richardson, Bureau Clerk.

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GROWING SCARCITY OF CONIFEROUS TIMBER.

By Walter Gill, F.L.S., F.R.H.S., Conservator of Forests.

(Continued from page 532.)

Can South Australia grow any Pine Timber?

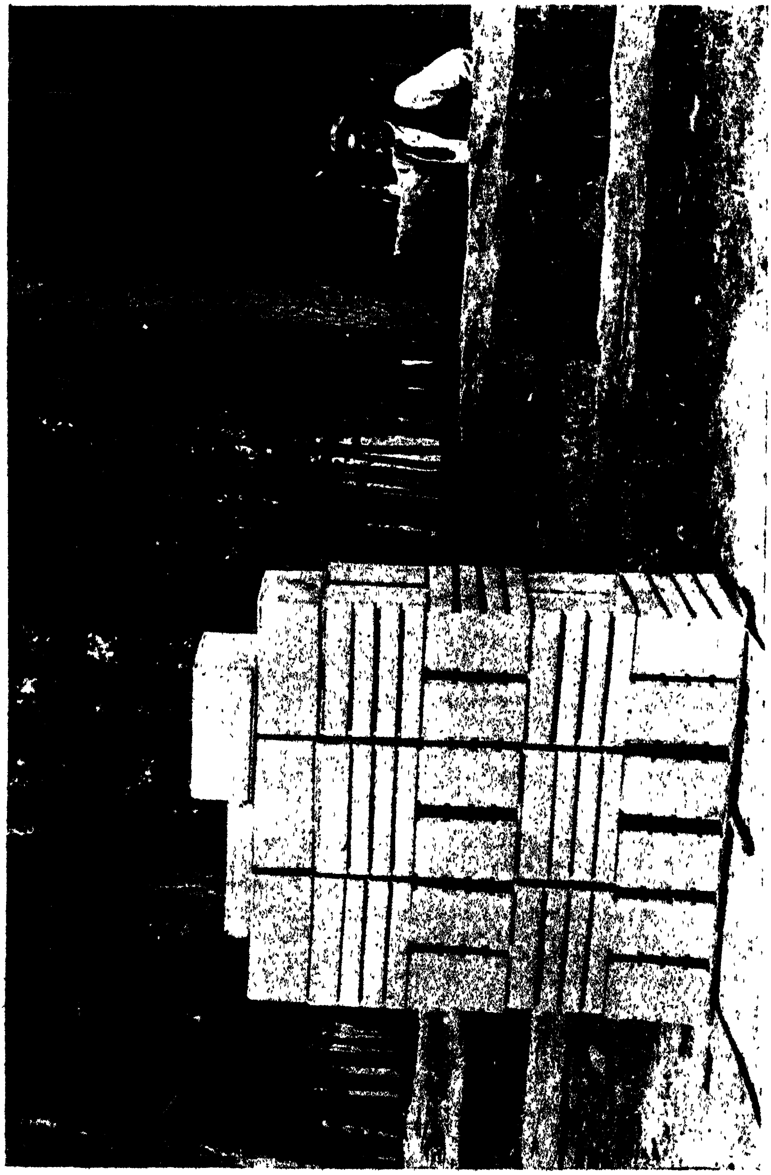
In endeavouring to find an answer to this question it is essential to bear in mind the following important considerations:—

a. Some pines, the timber of which for generations has been a main source of supply in the European markets, cannot be grown here because the climatic conditions are unsuitable anywhere for their proper development.

b. Even if in some localities climatic and other conditions are favourable for the growth of some species, the area where these conditions exist is either required for other purposes generally considered more important than timber growing, or it is of too limited an extent to produce timber in sufficient quantities to prove of any appreciable value in providing an efficient supply for the State's demand for coniferous timber.

c. The experiments made by the Forest Department during the last 25 years have been carried out, for the most part, in districts in the State where the best all-round conditions do not prevail. This circumstance has a specially important bearing on the question under review, as it is in connection with the work of the department that the necessary facts are forthcoming to solve the problem of pine production.

So far, of course, as some pines are concerned, it is a distinct disadvantage that they cannot be grown here; but, on the other hand, as an offset against this, it must be remembered that the growth of some pines here is so rapid that they will attain certain given dimensions in from one-third to even one-half less time than in some other countries. Numbers of different pines have been planted in various parts of the State by private owners on their estates: no expense has been spared in many instances, and, as a result, some fine collections of conifers are to be found, which speak volumes for the arboricultural enthusiasm of those possessing them. An inspection of such trees as these affords great pleasure to a forester; it gives ample opportunity to note the general habit and balance of each tree when growing by itself, with ample room for development as an object of beauty in the landscape. It is of great service as a reference in comparing and determining the species of any trees the nomenclature of which may be in any doubt. But as a means of gauging the probable timber production of each species such trees are unreliable, because their behaviour under the open unrestricted conditions of an arboretum, whether as individuals or in widely spaced lines, or in open groups, is very different from what it is under the close wood system, which is simply



W. Gill.] *Twenty-eight Apple Export Cases, made from one Remarkable Pine grown in Wirrabara Forest in twenty years.* [Photo.

an intelligent imitation of natural forest conditions, and which experience, during many generations, has taught foresters, beyond all doubt, is the only satisfactory system of making the biggest timber profit off the smallest area, and producing the greatest quantity of sound merchantable timber with the least waste. Trees growing by themselves lessen their diameter very rapidly or taper quickly, and make big, heavy branches, which, being generally fit for firewood only, are comparatively valueless in many places. Grown close together the strength wasted in the limbs by the open-grown tree is thrown into the main trunk, where it is wanted, and where it fetches most money. Hence it is that to arrive at sound and reliable conclusions as to the timber productivity of any given pine it must be grown under a proper forest system for a term of some years before reliable data can be secured. This has been done by the Forest Department in this State for quite 25 years, and facts of a most encouraging and trustworthy character are available as a result of careful observation and closely studied calculation.

It might be of interest to some to review the results attained in the culture of all the pines which have been tried by the department. It is not, however, intended in this connection to enter into details regarding pine culture in its entirety, but briefly to record the facts of commercial weight which have been collected in the greatest quantity regarding three pines, all well known, which have given the most certain evidence of reliable commercial utility, viz., the Remarkable pine (Pinus insignis), the Maritime pine (Pinus maritima), and the Aleppo pine (Pinus halepensis). These three are the cheapest to rear and plant, and, being on the whole adapted for a wide area of country, have been those most extensively tried. Had the department been more favoured as to sites and conditions it is possible other pines might have proved reliable also.

According to the custom followed under all well-regulated systems of forestry, measurements, both of sample trees and sample areas of trees, have been carefully taken during the year, and on these all estimates are founded. In calculating the volumes of either trees or area, the ordinary tables by Hoppus, commonly in use, have been adopted; but, as is well known to all thoroughly versed in timber calculations, these tables give results 21½ per cent. under the true volume. This is, however, all the better for our present purpose, inasmuch as it will be evident that these calculations are well under the mark, leaving no danger of any exaggeration. In dealing with questions of this kind it must be remembered that it is not enough for any calculation to show that a certain volume exists in a piece of timber. The shape in which it has grown has a most vital influence on the commercial result to be secured. Hence, to be safe, "to make assurance doubly sure and take a bond of fate," given pines of three separate species have first been measured and converted into cases of a well-known type (and of a given content in superficial feet), and afterwards the difference in super. feet between the volume or quantity calculated and the volume actually made up into cases has been carefully noted. In all subsequent estimates these calculations have furnished a perfectly trustworthy basis, and the process has been fully explained here, as the cases will give a simple means of conveying a good idea of the quantity of pine timber, indicated in statements made later on, to those who may not have had occasion hitherto to interest themselves in the question of timber measurements. The results attained by these operations have been duly recorded in the annual report of the Woods and Forests Department for the year ending June 30, 1902, where it is stated that a Remarkable pine (P. insignis), about 20 years old, grown in the Wirrabara Forest, was felled to test the return obtainable therefrom in the form of cases for fruit export. The total length of log converted was 43 ft. 6 in., with 6½-in. quarter girth, giving a content of 153 super. feet. From this 28 cases were made of the kind known as the "Peacock" apple export case, which contains five super. feet, and thus the quantity of timber of the calculated content actually used was 140 super. ft., or 90 per cent.; while of the 10 per cent. remaining a few boards for the next case were obtained. Another specimen tree felled was a Maritime pine (P. maritima), about same age, and grown in the same forest. Total length of log converted, 32 ft.—7¼-in. quarter girth; total volume, 140 super. feet; and from this tree 25 cases were made similar to the others. During the current year a third sample tree has been

W. GILL.] [PHOTO

Twenty-five Apple Export Cases, made from one Maritime Pine grown in Wirrabara Forest in twenty years.

felled and made into cases like the rest. This was an Aleppo pine (Pinus halepensis), age 20 years, from Wirrabara Forest, the total length of timber converted being 36 ft.; quarter girth, 6¼ in.—108 super. feet. The number of cases obtained was 16, with several extra boards for other cases. The accompanying photographs give a clear idea of the three lots of cases referred to.

Sample trees of the three kinds of pine having been exploited in this way, the method adopted to ascertain the actual volume of timber standing on given areas was as follows:—Blocks were selected of a thoroughly representative character in Wirrabara and Bundaleer Forests, in the forest plantation near Kapunda, and in Mount McIntyre Forest Reserve, in the south-east, near Millicent. They varied in size from one-quarter of an acre to six acres, totalling 11¼ acres; and after they had been carefully chained off, the pine trees standing thereon, numbering in all 3,830, were measured in the usual way, according to standing forest practice, height being taken only to 4-in. diameter, and the volume computed in due course. The data thus obtained show that on the areas of Remarkable pine at Wirrabara, Bundaleer, and Mount McIntyre (where the plantations approximate most nearly in age), an average of 21 years' growth gives a total of 2,000 cubic feet, or 24,000 super. feet per acre, nine-tenths of which is convertible into box lumber. To make the matter clearer, after allowing a wide margin, this means that 4,000 cases of the type already described could easily be made from the pines on each acre. These cases are purchased by fruitgrowers in the Wirrabara district at 1/ each, delivered there, which means a gross value of £200 per acre, after 21 years' growth. From enquiries re probable price of production, it appears safe to estimate the cost of sawing, &c., with a suitable plant at 50 per cent. of the selling price, leaving £100 per acre net result. Strong views have frequently been advanced against this pine, in most cases by those who were practically unacquainted with its nature and behaviour under systematic culture, and judged it either by hearsay or from ornamental specimens they had seen. The Forest Department, having fully tested it for a series of years, is able to prove beyond doubt its special excellence for box lumber, and its general utility for wagon and dray bottoms and sides, ladders, barrows, rafters, planking, flooring boards, and other purposes; but any special pleading in its favour is rendered unnecessary in the present instance; because, in districts where once it was condemned untried, those falling into that error are now convinced of its value, and are anxious to obtain cases when available; and when the purchaser is satisfied, mere theoretical discussion is useless. Calculating the areas of Remarkable pine by themselves, we find the annual growth or increment per acre to amount to 100 cubic feet; but when the other pines, Aleppo and Maritime, are averaged with it, the annual acre increment falls to 80 cubic feet; as, though the Aleppo and Maritime give valuable results, their growth is not so rapid as the Remarkable pine, nor do they give so large a yield per acre. When, however, it can be plainly demonstrated that averaging the three pines indicated—after thoroughly testing them—the yield per acre even at such an early stage of growth as 25 years comes out at 80 cubic feet, or 960, nearly 1,000 super. feet per annum (excluding branch and top wood), the department feels justified in claiming that the question—"Can South Australia grow any pine timber?" has been fairly answered in the affirmative, more especially when it can safely be asserted that measurements at a more advanced stage of growth will show a much higher annual increment than at present—a very important fact to be borne in mind. Much more might be advanced on this subject; but ere closing these remarks brief reference must be made to the question of cost of establishing plantations. There are thousands of acres in the State suitable for pinegrowing now carrying inferior timber of practically no value, or scrubby vegetation. The cost of clearing, fencing, and planting varies according to circumstances; but, speaking broadly, a plantation of pines may be established under suitable conditions, and maintained till it represents the gross value already indicated of £200 per acre, at a cost varying from £5 under the most favourable conditions to £10 per acre where more work is needed to prepare each acre for planting. The ultimate return to the revenue shown as probable from the estimates given is surely in itself a highly satisfactory one; but there are other aspects of the matter quite as important

W. GILL.] *Sixteen Apple Export Cases, cut from one Aleppo Pine grown in Wirrabara Forest in twenty years.* [PHOTO.

as the revenue one. The German forests, which are rightly regarded as of incalculable value to the State, support directly 1,000,000 people in employment; while another 3,000,000 are maintained by industries connected with them. In these days of scarcity of employment for willing hands is the possibility of ultimately retaining in the country money at the rate of £100 per acre (estimating 50 per cent. as the workers' share of the amount produced—i.e., £200 per acre) to be lightly thrown aside? Much of forest work comes in when men find difficulty in getting other employment—viz., between seeding and shearing.

Extensive tracts in the Ninety-Mile Desert will grow the Maritime pine, which, from careful observations regarding the behaviour of trees planted there, is evidently more at home in that locality than in other parts generally considered far better country. Once let pine forests be established there and the problem as to the possibility of its utilization would be far on towards a satisfactory solution. Making and maintaining forests means that men must be employed to do it. It will pay well, given the requisite time and patience for development. It will pay in revenue; but it will pay better, there and in other districts, in the healthy strong men it rears amidst healthy forest conditions—in the increase of the producing power of the country, and in assisting to prevent the congestion of our population in our cities. The Maritime pine forests in the south-west of France now cover 300,000 acres of what was once waste, useless land, and support a considerable population employed in producing turpentine and its bye-products from trees that afterwards yield large quantities of lumber for the boxes required in the onion and orange export trade of Spain.

Our dairy, fruit, and other industries which need box lumber are constantly increasing their demands, and suitable sites are only awaiting a moderate outlay to produce the timber they want. A hesitating policy may find defenders during the initiatory stages of any industry; while experience has yet to be obtained as to the best methods of developing it under new conditions. In sailing through an uncharted sea difficulties will naturally occur to the navigator, and some errors in establishing a new undertaking are to be anticipated; but with the valuable knowledge gained by the Forest Department during the past 25 years as to the trees most suited to our special conditions, and with the results that can be shown even at this early stage of its work (for 25 years counts but as one-fourth of the life of many timber trees), there should now be no further need for extreme caution. What has been done is but a fraction of what is needed. The time has come for action on a more extended scale! South Australia has pluckily led the van in establishing scientific forestry in the southern hemisphere! Is she still to lead in this all-important national work, or let others, profiting by the experience she has gained, eclipse her in forest culture? Let it be remembered that every year this question is played with is a year irrevocably lost. Inspector Melard, of the French Forest Department, in his impressive report on "The insufficiency of the world's timber supply," says:—"The situation is full of peril, and the need of instructing public opinion is urgent. . . . There is not a moment to be lost. Forest produce cannot be procured at a moment's notice like a loan of cash."

CORRESPONDENCE.

[In this column we propose to answer questions of general interest, and also to make selections from our official correspondence. Questions dealing with matters of interest mainly to the writer will be answered direct. Correspondence invited. Ed.]

ADULTERATED CHAFF.

"Whyte-Yarcowie."—The mixing of chaffed header straw with chaffed hay undoubtedly constitutes an adulteration, but it would be very difficult to deal with by legislation. Most people buy chaff by sample, and would naturally avoid the inferior mixture. If hay crops were cut in a greener stage than is usual, the colour would be a much better guide than at present as to the genuineness of the chaff. Notwithstanding the absence of grain in green hay chaff, I believe it is more nourishing than genuine dry hay chaff, which is frequently little better than straw, containing a fair proportion of shrivelled grain.

IRRIGATION ON THE MURRAY: UTILISATION OF THE SWAMP LANDS.

By Arthur J. Perkins, Secretary for Agriculture

[Continued from pps. 494 and 536.]

In our last issue, consciousness of the lack of familiarity of many with such matters, led me into a somewhat lengthy digression on the interpretation that may legitimately be placed on the results of soil analyses; the road now lies open to a discussion of this question in so far as it concerns the soil of the Lower Murray swamps at Wood's Point. With respect to those substances that essentially characterise the fertility of a soil, Mr. Chapman, of the Adelaide School of Mines has supplied me with the following data:—

TABLE III.

Percentage of Fertilising Substances in Wood's Point Swamp Soil, expressed in Terms of Soil Dried at 105° C.

Total nitrogen (exclusive of nitrates)	0.51 per cent.
Total phosphoric acid (P_2O_5)	0.20 per cent.
Potash (K_2O) soluble in strong hydrochloric acid	0.88 per cent.
Lime (CaO) soluble in dilute hydrochloric acid	0.60 per cent.

The figures in Table III. will speak in clearer language if translated into lbs. per acre, and an unquestionably better idea of the great fertility of the soil in question will be gained by comparing these results with those of other analyses. In Table IV. will be found:—(1) Fertilising substances in Wood's Point soil reduced to lb. per acre of 3,250,000 lb.; (2) fertilising substances similarly expressed in average typical good soil; (3) fertilising substances similarly expressed in poor soil from neighbourhood of Millicent. I would much have liked to have been in a position to add a fourth term of comparison, namely fertilising substances in our average agricultural lands; unfortunately, local analyses are as yet too limited in number to enable us to refer with accuracy to averages. The utmost that can be said at present is that evidence available tends to prove that both in nitrogen and phosphoric acid the average South Australian soil falls considerably below the quantities usually ascribed to a good average soil; of potash, on the other hand, it contains usually an abundant supply.

TABLE IV.

Weight of Fertilising Substances per Acre at Wood's Point Compared with Weights in Typical Good Average Soil and in Poor Soil from Millicent.

	Weight of fertilising substances per acre of 3,250,000 lbs.		
	Wood's Point swamp soil.	Typical good average soil.	Poor soil from Millicent.
Nitrogen	16,575 lbs.	3,250 lbs.	1,462 lbs.
Phosphoric Acid ..	6,500 ,,	3,250 ,,	325 ,,
Potash	28,600 ,,	7,500 ,,	617 ,,
Lime	19,500 ,,	162,500 ,,	2,275 ,,

I take it that such figures render unnecessary any lengthy comment on my part. The swamp soil, as might have been anticipated from the results of the mechanical analysis, is abnormally rich in nitrogen; of phosphoric acid it contains twice the amount normal to a good average soil, and probably 10 times the quantity usually found in the average South Australian soil; in potash soluble in strong acids, it is again exceedingly rich—a fact already foreshadowed in the physical analysis by a high proportion of fine silt or colloidal clay.

The weakest feature in the soil may be described as relative poverty in lime; not that for present purposes there does not exist an ample supply. So far as food requirements of plants are concerned 7,500 lb. of lime per acre, instead of 19.500, would represent all that is needed. It should not be forgotten, however, that this is essentially a compact soil, liable to cake that it owes its present friability and openness to the presence of an abnormally large proportion of organic matter; that tillage must tend to reduce this organic matter, and that ultimately poverty in lime must inevitably end in bad mechanical condition of the soil.

It may, perhaps, be as well to add that on the whole the figures in Table IV. do but bare justice to the Wood's Point soil. To assume that the active portion of a soil, that is to say, the portion from which roots mainly draw their sustenance, lies within the first foot, may be sufficiently correct for average comparisons; in exceptional or extreme cases the assumption is apt to be misleading. The black soils of Russia that have hitherto yielded uninterruptedly and successively heavy crops of wheat without the addition of manure in any form whatsoever, are classical examples of such exceptional cases; it is not so much abnormal richness in fertilising substances that characterizes the latter, as exceptional depth; proportionately to what obtains in average soils, the roots of annuals are, therefore, able to draw for their requirements on a far greater bulk of matter. At Wood's Point the cases are perhaps not absolutely parallel, for doubtless irrigation must introduce a new factor that will not be without its special influence. Unquestionably plants that are irrigated encroach less upon the depths of a soil than plants that have to rely upon the heavens alone for the essential moisture; it is possible, therefore, that the roots of many plants will not be tempted beyond the first foot, and so far as they are concerned figures in Table IV. probably set out correctly the stores of plant food at their disposal. With plants, on the other hand, that are naturally deep rooted, such as lucerne, for instance, there is little doubt that the wealth of the second foot, and perhaps beyond, will be exploited, and as this second foot is equal in natural fertility to the first, in such cases figures given in Table IV. may fairly be doubled without fear of exceeding the limits of probability.

Probable State of Availability of Fertilising Substances in Wood's Point Swamp Soil.

There exist many instances, in which soils apparently rich in fertilising substances have, nevertheless, responded satisfactorily to dressings of various types of manures; that is, under their influence they have yielded remuneratively heavier crops. Hence the opinion, that whilst a soil might apparently be abundantly stocked with nitrogen, phosphoric acid, or potash, it is possible for these substances to be present in such form as to be all too slowly available for the production of heavy yields. That this forms a correct explanation of the facts, is nowadays generally accepted; and an enquiry into the availability of the plant food generally follow any statement having reference to more general analytical data. Attempts have certainly been made to solve questions of this nature in the laboratory; it cannot, however, be said that they have at all times given entire satisfaction, and unquestionably field tests alone can in the end give definite and final solution to what in the present state of knowledge the laboratory can only indicate in faint and halting outline. These laboratory methods are largely based on what are known to be the methods of action of roots in quest of food; the latter creep amongst the soil particles, a majority of which contain infinitesimal quantities of what for want of a better term we may call plant food; portion of it under the influence of various agencies is already in solution, or capable of entering into solution in soil moisture; the latter, if in such combination as will penetrate the cell walls of the root hairs, is readily absorbed. Other portions offer greater resistance to absorption, not always, however, beyond the power of the clinging roots; the latter emit a weak acid fluid of greater dissolving power than ordinary soil moisture, and by its means render available or soluble a new portion of plant food that can then enter into the economy of the plant. Thus, in the laboratory, so far as the requirements of plants in phosphoric acid and potash are concerned, the availability of these substances is reckoned in terms of the proportions that are yielded up to weak acid solutions, as representing the contact action of roots. The weakness of this method lies principally in the fact that under the influence of soil reactions, which it is impossible either to determine or foresee, this nominal availability is liable to very frequent fluctuations; absolute reliance cannot. therefore, be attached to it. The same reproach may, of course, be cast at field trials and results; but to the attentive cultivator field yields speak in a language that admits of no misunderstanding, and given a falling off in the yields that cannot be traced to the influence of seasons, a few carefully conducted field tests will always instruct him as to the special substances of which his crops may be in need of.

I have not thought it necessary at present to have the amount of phosphates and potassium salts of the Wood's Point soil soluble in weak acids estimated; should occasion arise, it is possible that at some later date there may be interest in pushing investigations in this direction. There is, however, certainly no pressing necessity for such work, for in abundant and heavy crops of various kinds the soil has already borne ample testimony to the evident availability of what is essential to good plant growth.

Some further discussion on this point will not, however, be without interest. The special mode of formation of the swamps, the good mechanical condition of the soil, everything points to a continuance of this condition of availability of plant food for, at all events, some considerable length of time. I have hitherto made no reference to the availability of the nitrogen, because in a sense it stands alône, and does not admit of reliable measurement by ordinary laboratory methods. It was an axiom of the past, to which one would fain have ascribed immutability, that a sharp distinction existed in the attitude towards dead organic matter of two different classes of plants. Saprophytic plants, such as mushrooms, it was said, absorbed directly organic compounds with which they came in contact; is it not a matter of common experience that the latter grow freely on old manure heaps and other accumulations of organic debris? Plants with chlorophyl, or green plants amongst which may be ranged all our cultivated plants, on the other hand, it was added, could only utilise organic matter after its reversion by various processes of decomposition to the mineral state. There is little doubt to-day that Nature has by no means separated plants in divisions so absolute, that most green plants are endowed with the power of absorbing organic nitrogen, in compounds more or less degraded from the original type; that with some this power is exercised but sparingly, whilst with others its existence may, perhaps, be almost essential to good and healthy growth. Again, contrary to what was long the prevailing opinion, plants are undoubtedly capable of the direct absorption of ammonium salts. These reservations notwithstanding nitrates remain the main source from which our cultivated plants draw the nitrogen essential to the building of their tissues; and it is mainly from considerations having reference to their gradual formation in the soil that we can discuss the availability of the nitrogen in Wood's Point soil.

From this point of view, we may assume that in the mass organic matter in this soil is not directly available to the plants, and only becomes so gradually under the influence of the destructive process known as nitrification; this involves the breaking up of organic matter under bacterial agency into nitrates, which are then directly absorbed by the roots. Nitrogen, therefore will only become available according as and to the extent that general conditions favour nitrification. Let us endeavour to determine what is likely to be the position of the swamp soil in reference to this question when brought under the influence of cultivation.

The first point affecting the formation of nitrates is aeration of the soil; no nitrification can take place in soil through which air does not circulate freely. We have already noted the present open nature and friability of the swamp soil; we have also noted the present existence of almost perfect natural drainage. So long as such conditions obtain, ordinary tillage operations will supply all the aeration that is necessary, and from this source no obstacle to nitrification need be apprehended.

The activity of the nitrifying bacteria is largely a function of the state of humidity of the soil; and as their action is mainly confined to surface layers, it follows that the agents of dessication, such as strong winds, extreme sun heat, dryness of the surrounding atmosphere, must, under climatic conditions such as ours, exercise an important influence on the progress of nitrification. In a dry soil this process is more or less completely checked, whilst it proceeds under most favourable conditions in soils retaining from 10 to 15 per cent. of moisture. Evidently in land that is irrigated, this state of dampness can readily be maintained at times that are most opportune. For it should not be forgotten that nitrates, unlike some other salts, are not retained by the soil; and to irrigate heavily land that does not carry plants in strong vegetation must result in the washing out of nitrates formed in the drainage waters and beyond the reach of roots. We have on several occasions noted the good natural capacity for drainage of the soil in question, and its high retentiveness of moisture. The combination of these qualities favours the formation of nitrates under irrigation judiciously applied; at the same time ill-timed application of water must tend to waste the natural fertility of the soil.

The formation of nitrates presupposes, of course, the presence in the soil of a substance capable of yielding them by decomposition. The heavy yield of cereal crops that have been gathered off the swamps prove definitely that there is as yet no deficiency of nitrates and, by inference, of substances capable of yeilding nitrates. Owing to their extreme solubility the amount of nitrates present at any given time in a soil is liable to considerable variations; the chemical estimation of the latter is, therefore, apt to be misleading. I have, nevertheless, asked Mr. Chapman to estimate the nitrates in the soil, so as to form some idea as to their proportion at the time of examination. The figure given is 0.0042 per cent. of nitrogen in the form of nitrates, which corresponds over the first foot of soil to over 8 cwt. of nitrate of soda—a quantity quite ample to satisfy the requirements of the most insatiable of plants. It is probable that under a rational system of culture this satisfactory condition of affairs will continue for some considerable portion of time.

No nitrification can take place in an acid soil, and in a soil in which there is little or no basic matter with which the nitric acid formed can combine the nitrifying bacteria are soon paralysed in their action. We have already noted relative poverty in lime, a feature that under the influence of constant cultivation must inevitably become more accentuated in the course of time. From the point of view that at present concerns us, there appears, however, to be no crying necessity for the presence of a larger quantity of lime than at present obtains; and when time has so modified the nature of the swamps as to render liming advantageous or even necessary, there will be no special difficulty in meeting this new requirement.

Nitrification progresses rapidly at high temperatures, providing always 100 deg. F. is not exceeded by much. In common with the rest of our good agricultural lands, it follows that these swamp lands must reap the benefit of our warm genial climate, and that, unlike the soils of colder countries they will offer no interruption to the process of nitrification beyond that arising from occasional excessive summer heat. It is probable, too, that where land is irrigated checks in this latter direction are likely to be far less numerous than is the case on ordinary agricultural lands.

Finally, there is no doubt that an excess of common salt (sodium chloride) hinders, and even completely checks, nitrification. I shall have to note in a subsequent article the presence of appreciable quantities of this salt; at this juncture I shall content myself with stating that it does not appear present in such quantities as to influence the formation of nitrates.

After dealing somewhat in detail with conditions that affect the availability of nitrogen, I may deal more briefly with that of phosphates and potassium salts. The nature of the soil is such as to lead one to believe that these substances are in the swamps in a high state of availability. The fine state of division, and abundant supply of organic matter, which we have on several occasions noted, all tend to support this inference. Further, exceptionally heavy yields, such as have been obtained here, offer of themselves incontrovertible evidence of the ready availability of such necessary substances as those under consideration. It may be added that tillage aided by irrigation can, by comparison with tillage left to its own resources, but help to increase, or at least maintain, this satisfactory state of things.

In the June number I hope to be able to conclude this series of articles by an examination of the rather important question of the presence of saline substances injurious to the growth of plants.

(To be continued.)

LUCERNE FOR PIGS.

Professor Lowrie frequently referred to the pig as a grazing animal, calling for different treatment to that generally given it. In his last address to South Australian farmers at the 1901 Annual Bureau Congress he stated the most profitable way to keep pigs was to let them graze in the fields for a considerable period of the year, taking care, of course, that there was green feed for them. He found they were less trouble, and thrived better in the field, and fattened rapidly when fed on grain and other foods.

In January of this year, before the annual meeting of the Nebraska Swine-breed Association, the President of the Payne Investment Company read a paper, giving the results of experiments to test the value of lucerne for pigs. The organization, of which Mr. G. H. Payne is the head, deals in the breeding and fattening of live stock on a very extensive scale, and grows large areas of lucerne for food for their animals. On one of these farms there are 21 acres of old lucerne, five acres of new lucerne, sown in 1902, and about 10 acres of cane: total, 36 acres. The first crop of lucerne on the 21 acres was cut June 1, and from that time up to November 14 the lot has been pastured with an average of about 160 head of hogs, all ages. The man in charge has kept as accurate an account as possible of the weights of the hogs and feed given them, the idea being to satisfy the owners of the property as to the value of lucerne as pasturage for hogs and as hay. In addition to running the 160 head of hogs, as above mentioned, the lucerne was cut twice after June 1, making three cuttings in all and the cane was cut once. The aftergrowth was then pastured over. The total tonnage from the 36 acres just mentioned is as follows:—Lucerne, 88½ tons from 26 acres, or 3.4 tons per acre; cane, 22½ tons from 10 acres, or 2.2 tons per acre. The hay was sold to a Western cattle company. It is now being fed on the ground (we do the feeding) at $4.50 per ton, netting us the following:—88½ tons of hay at $4.50, $398.25; 22½ tons cane, sold at $4.00 per ton, $90.00; total sales from 36 acres, $488.25. This shows that in addition to pasturing 160 hogs for the season this 36 acres (five acres was new seeding and cut but once) produced $488.25 in hay, or $13.50 per acre.

The hogs were weighed on the 14th day of each month, with this result:—

First lot, 59 stock hogs, on June 14 weighed an average of 108 lb. each; August 14 weighed an average of 144 lb. each. This was a gain of 36 lb. each in 60 days, or .6 of a pound per day. These hogs were fed as near as could be measured one-half pound of shelled corn each per day, the gain in weight per day being greater than the grain fed. A very satisfactory showing.

Second lot, 30 shoats, on August 14 weighed an average of 131 lb. each. They were put in separate pasture and fed about 4 lb. of ground wheat and rye per day, with all the lucerne they wanted to eat. On October 14 they weighed an average of 190 lb. each, a gain of 59 lb. in 60 days, or practically 1 lb. each per day. This experiment showed an unsatisfactory gain in comparison with the large increase in grain fed. The only solution that we can give when comparing it with the result of feeding corn to the first lot, is that the ground wheat and rye fed with lucerne was not as good a balance-ration as corn fed with lucerne.

Third lot, 86 May and June pigs, after weaning, on August 14 weighed an average of 27.1 lb. each. October 14 they weighed an average of 45.8 lb. each, a gain of 18.7 lb. each in 60 days, or practically 1-3rd of a lb. gain per day. November 14 they weighed an average of 61 lb. each, a gain of 15.2 lb. in 30 days, or ½ lb. per day. The first 30 days after these pigs were weaned, namely, from August 14 to September 14, they practically made very little gain. They were fed 1 lb. of ground wheat and rye per day per pig, fed as slop, and had plenty of lucerne pasture. The gain in this experiment increased as the pigs grew, the last 30 days being ½ lb. gain per day, as against 1-3rd lb. per day for the first 60 days. They were scrubby, poor sticks, purchased when weaned; and it was not a satisfactory experiment, although the gain was made at a very low cost.

Fourth lot, 22 young thoroughbred Duroc-Jersey sows, on September 14 weighed an average of 100.1 lb. each. On November 14 they weighed an average of 151.3 lb. each, making an average gain of 51.2 lb. in 60 days, or .8 of a pound per day. These hogs were fed 1 lb. of wheat, rye, and corn chop per each day, and lucerne pastured. This is considered the best gain of all the experiments, .8 of a lb. per day being considered a very large gain for any hog with such a small ration. The 22 hogs were thoroughbreds, purchased at the Nebraska State Fair. They were in excellent flesh when bought, and took very heartily to the lucerne pasture, and from that date have thrived wonderfully.

It has not been the intention to see how rapid a gain could be made; but how much gain for the smallest amount of grain required with the lucerne to keep hogs growing. It is generally conceded that it takes from 4½ to 6 lb. of grain to make 1 lb. of pork. The experiments above prove beyond all question of doubt that a gain of 1 lb. of pork can be made with from 1 to 2 lb. of grain and such lucerne pasture as a hog will eat. It seems from these experiments that pork can be made on lucerne with a very small grain ration at from 1½ to 2 cents per lb.

Other experiments were made to test the fattening capabilities of pigs raised on lucerne in this way. Twenty-three hogs which had run during the summer on lucerne, and received half a pound of maize each daily until October 1, and thence 1 lb. daily, were put in a separate lot on a full corn feed on November 15, when they weighed 180 lb. each. On December 4 they were sold and weighed (shrunk) 233 lb. each, a gain of 52.5 lb. each in 19 days, or 2.7 lb. daily. The pigs consumed 11.2 lb. of corn daily, and sold at 5.6 cents per lb. It cost, in corn, 2.6 cents for every pound of increase, and left a profit of 3 cents on every pound of gain made. A further experiment was made with finely chopped lucerne hay, and the conclusion arrived at was that 1 lb. of corn mixed with 5 or 6 lb. of this lucerne chaff, and fed daily to the hogs, will carry stock hogs over the winter as satisfactorily as the ordinary ration, mostly of corn, which costs three times as much as the lucerne and corn ration. With brood sows the ration was equally satisfactory.

EGG-LAYING COMPETITION.

The egg-laying competition organized by the proprietors of The Sydney Daily Telegraph, and carried out at the Hawkesbury Agricultural College, came to a conclusion on March 31, after having extended over a period of 12 months. In our issue of December last (pages 362/3) we referred to results for the six months ending September, and the conditions as to feeding, &c. The following is a summary of the year's test—excluding the breeds represented by less than three pens:—

Breed.	Total number of Hens of each breed.	Average yield per Hen—All Pens.		Average yield per Hen—Best Pen.		Average yield per Hen—Poorest Pen	
		No of Eggs.	Value of Eggs.	No. of Eggs.	Value of Eggs.	No. of Eggs.	Value of Eggs.
			s. d.		s. d.		s. d.
White Leghorn ..	30	145·8	17 2⅔	185·5	23 4½	117·5	13 4⅝
Black Orpington	48	142·5	17 5	171	21 10	103	11 6⅝
Silver Wyandotte	24	142·5	17 9⅓	170	21 5	119	13 10½
Buff Orpington ...	24	134 5	16 6	146·8	18 11	115·5	13 10
White Wyandotte	18	113·3	13 4	133·8	16 10	87·	9 4½

Of the breeds with only two pens in the competition, Buff Wyandotte averaged 135.9 eggs per hen, Buff Leghorns 111.8, Andalusians 111.5, Anconas, 109, Minorcas 82.4.

The above table demonstrates that "breed" alone is not everything, but that the strain also has a marked influence. In other words there are good and poor strains in all the laying breeds of fowls. The columns showing the highest and lowest averages are of special interest. It will be seen that in value of eggs the White Leghorns varied to the extent of 10/ per hen; Black Orpingtons 10/3, Silver Wyandottes 7/6½, Buff Orpingtons 5/1, and White

Wyandottes 7/5½. The difference in value of the eggs would, in every instance, mean the difference between profit and loss.

Another point of interest is that while the White Leghorns occupy the first and second places on the egg record, they are only third in the average value of eggs laid, viz.—Silver Wyandotte 17/9 1-3 per hen, Black Orpington 17/5, White Leghorn 17/2 2-3. This is, of course, due to the fact that the latter laid a large proportion of eggs when prices were lower. The position occupied by the Minorca pens is a very poor advertisement for the two strains of this breed which took part in the competition.

The records of the first four individual pens of six hens each are as follows:—

Grantham Poultry Farm—Rose-comb White Leghorns laid 1,113 eggs, valued at 130/3.

Mr. G. Kennedy's White Leghorns laid 1,041 eggs, valued at 126/2.

Mr. M. Ward's Black Orpingtons laid 1,026 eggs, valued at 131/.

Mr. A. E. Henry's Silver Wyandottes laid 1,020 eggs, valued at 128/6.

Considerable interest is being shown in the second competition, started on April 1, at Hawkesbury, and in the competition being carried out at Magill under the auspices of the Royal Agricultural Society of South Australia. Added interest is given to the Hawkesbury competition by the presence of three pens sent specially from America.

A POULTRY RECORD.

MINORCAS AS EGG-LAYERS.

By Beginner

While we frequently publish statements as to whether it pays to keep poultry when all the food has to be purchased, it is rarely that actual figures are available. Having kept daily records for two years of all items of revenue and expenditure in connection with a small flock of fowls, the following summary of the results from April 1, 1902, to March 31, 1903, may be of interest. I select these dates as they are those selected in the various laying competitions:—

Poultry Account, April 1, 1902—March 31, 1903.

To value of Stock, 1/4/02, 26 at 1/6	£1	19	0	
Food—Wheat, 22 bushels	6	1	1	(average price per bush. 5/6)
Pollard, 31 bushels	2	12	8	(average price per bush. 1/8)
Bran, 10½ bushels	0	17	11	(average price per bush. 1/8½)
Barley, 8 bushels	1	12	1	(average price per bush. 4/)
Copra, grit, bonemeal, &c.	0	13	9	
Sitting Orpington eggs	0	5	0	
Depreciation 10 per cent., interest 5 per cent. on value of houses, yards, &c., £7 10/	1	2	6	
Total	£15	4	0	

By eggs—2,542—value at auction rates	£8	15	11
Fowls sold or consumed (21)	1	7	8
Stock on hand, 79 at 1/6	5	18	6
	£16	1	8

Nothing of course is allowed for labour. This is not much, and is done in spare time.

It will be seen that, in spite of the heavy price for foodstuffs—fully 75 per cent. above normal rates—I came out on the right side. Every scrap of food for the fowls, other than a little stale bread, has been paid for. A little meat has been obtained for nothing; but other domestic animals utilize nearly all the waste from the table. As a set-off against any little value in food not accounted for, nothing is shown in the revenue for two Minorca roosters given away to friends.

On the revenue side the value of eggs is price given at Adelaide auction sales. Eggs actually sold fetched from ½d. to 1d. per dozen above these rates. Fowls consumed—young cockerels—have been valued at from 1/ for four months' old, to 1/6 for six months' old birds. Equal quality could not have been purchased at these prices. Stock are valued at 1/6 each. Of the 79 only about 30 would be parted with at this figure; the balance being Minorca and half-bred Wyandotte pullets 4½ to 6½ months old.

The result of the laying competition at Hawkesbury, New South Wales, has caused considerable interest in the laying qualities of various strains, and, to the surprise of most people who keep that breed, the Minorca occupies a very inferior position. Two pens were entered, and the average production per hen for 12 months was 82.41 eggs, as compared with an average of 145.86 eggs from the White Leghorns, Black Orpingtons 142.54 eggs, Silver Wyandotte 142.54 eggs. In my small lot of poultry, I have a pen of nine Minorca hens, and the egg record each month since April, 1902, is:—

April	21	August .	134	December	151
May	70	September	189	January .	162
June	84	October .	200	February	151
July	66	November	200	March ..	102

This gives a total of 1,530 eggs, or an average of 170 per hen during the 12 months. As four of the hens were hatched on October 14, and two on December 28, 1901, and were therefore only 5½ months and three months old respectively at the commencement of the records, the results must be regarded as satisfactory. In the Hawkesbury laying competition only three pens exceeded the average of 170 eggs during the 12 months—viz., Rosecomb White Leghorn, 185½; White Leghorn, 173½; Black Orpington, 171.

The secret, if any, of my success, is good food, regular attention, and cleanliness. First thing in the morning the fowls get a handful or two of grain, and some are let out for a run. About two hours later they receive warm bran and pollard mash; two of pollard to one of bran. Sometimes this is mixed with meat broth from sheep's fry, sometimes with fruit scraps, but mostly plain mash. About once a week a little bonemeal is added, and occasionally a few ounces of Sunlight oil-cake. Another yard of fowls is released at breakfast. At midday a little barley, as a rule, is fed, and when available greenstuff is liberally provided. Between 5 and 6 the fowls all get a good feed of wheat. Douglas mixture is added to the drinking water once a week, and if any fowls show signs of diarrhoea or looseness, powdered charcoal is mixed in the morning mash for the particular yard. Shell grit is provided in each yard. The above is not exactly "copy book" treatment, but I find the fowls keep healthy and grow well. The egg record speaks for itself. My greatest difficulty in the past has been to provide sufficient green feed during the summer, as I am not able to command a supply of water to irrigate even a small patch of lucerne or other summer fodder. I find, however, that tree kale, mangolds, and sugar beet do well during the summer without irrigation if the land is deeply and thoroughly worked in winter, and kept cultivated during the warm weather, and am convinced that I can produce on a rod or two of land sufficient green stuff for 100 head of poultry.

POULTRY NOTES.

By D. F. Laurie.

The Egg-laying Competition at Magill.

Recently I accepted an invitation to accompany the committee on its first official visit to the Boys' Reformatory, Magill, where the competing birds are penned. The site is well chosen, and is to the north-east of the institution, bounded by a fine hedge, running nearly the whole length of the east side of the block of pens. This will afford shelter from gully winds next summer. On the west side a fence has been interwoven with bush, and a row of Yorkshire Hero peas planted on the outside. This will form a shelter from the westerly gales, which will be in evidence occasionally throughout the period. The slope of the ground is gentle, with sufficient fall for drainage. It is as sunny a spot as could have been chosen—an advantage during the cold months. The pens, 26 in number, are of ample dimensions, and are constructed with jarrah uprights, deal struts, and wire netting, surmounted by several strands of binding wire to guard against flying. The houses are of iron, semicircular top; the perches are of wood, and fit an angle-iron frame, which also stiffens the house. All houses have a northerly aspect. The name of the breed and competitor is on a neat plate. Everything was in excellent order, and the birds looked remarkably well, and reflect the greatest credit on Mr. Button, the Superintendent of the Reformatory, who has charge of all the birds. The feeding consists of soft food in the morning, and grain in variety at night. Grit, green food, cut green bone, &c., are all provided. Each pen is fed according to its requirements, which is what I before suggested, and thus each variety should be at its best. Even with the high price of wheat, bran, pollard, &c., Mr. Button finds the cost per head per week well under 2d., so that when foodstuffs regain their normal prices the cost will be about 1d. per week. This is a trifle different to the 6d. a week stated, as the probable cost by sundry critics.

There are 26 pens in the present competition. As regards the birds themselves, the majority have the fine head, bright eye, active, alert look, and general shape which characterize the layer, and I have every hope of a high average laying power. One or two looked thick-headed and sleepy, but they may improve, and turn out good performers. From time to time I shall publish notes and comments on the progress of affairs. So far the birds are shaping fairly well as layers. Already the committee speaks of a more enlarged competition next year. Certainly those who have brought the matter to so successful a stage deserve the highest praise, and I hope their reward will be a most successful issue. Just at the present moment the poultry industry requires all the help that can be given, and the widespread interest evinced on all hands in this egg-laying competition must have a beneficial effect. There are dozens of breeders and fanciers who could do a great deal of good, and then there is the S.A. Poultry Society. If the latter desires to be a fanciers' Society alone the committee should not appeal to the Government for prize money. The Royal Agricultural Society has acted wisely in financing the egg-laying competition, and it is to be hoped it will follow up its good work in other directions. I should much like to see a table poultry show in connection with the big Autumn Show, and now is the time to arrange a schedule with plenty of classes and prize money to induce a big display—it would prove a great attraction. Such a utility show would be deserving of the active and practical support of all classes of the community.

It is to be hoped that the publicity given to the egg-laying competition will induce all readers of The Journal to keep a close watch on their own hens with a view of ascertaining the number of eggs laid by each hen. There are plenty of good farm hens, pure or crossed, and often mongrels, which have an average of over 200 eggs. Where egg-laying is the point aimed at, such a hen is worth pounds to her owner if properly availed of. Laying is more a matter of strain than of breed, although several breeds are noted for egg production, and as such are to be preferred to mongrels. When an exceptionally good layer is found her eggs should be hatched, and the progeny carefully marked with wire rings. As a rule the pullets will be as good layers as the mother, and the cockerels, if pure, should be worth a lot of money to any wise man who is on the lookout for a laying strain.

COUNTRY SHOWS.

Considerable improvements can be made by the committees of the various Agricultural Societies throughout the State. As a rule the schedules are far too large—many breeds might be left out altogether. The utility breeds are those which require encouragement, and such others as Brahmas, Cochins, Polish, Spanish, should be left out. In all cases the single-bird system should be adopted—a few Societies still adhere to the old-time pair or trio, which is unworkable. Fewer classes and bigger prize money would ensure better displays. Then, again, if neighbouring Societies combined, a less number of good shows could be arranged, and some good would result. The educational value of a show is but little unless breeders are encouraged to breed and own really good specimens. When one notices so many very inferior specimens at country shows there appears to be some reason for the common dislike to pure stock. Those who hold this opinion are doubtless judging by the rubbish generally seen. Then, again, the judging should be done by experienced men, not by people who happen to have owned a few medium specimens, or who have been suffered to judge in the past because they are good fellows, and well known. Unless the judging is accurate the public and breeders are misled. I well remember a most agreeable man, in the country, confiding to me that he frequently judged, but declared he knew nothing about breeds, and made it an invariable rule in all classes but bantams to award the prize to the largest bird. Some judges have not even this consistency.

GENERAL

I hear moderate business is being done by Adelaide breeders in well-bred poultry. The prices current here are not to be compared to those common in New South Wales and Victoria. South Australians send freely to the other States, and pay big prices for birds, when they could get as good or better here for half the money. I hear as much as £12 is asked for silver Wyandotte cockerels in Victoria this year. South Australians offered this money, and could not get suited. It is high time to purchase stock for the coming breeding season; if left too late, the pick of the birds will be sold.

Colds will make their unwelcome appearance, and possibly, if neglected, turn to roup, during the cold weather. Cleanliness and care in feeding are two important points. Eucalyptus oil mixed with three times the quantity of salad oil will be found almost a certain cure, especially during the early stages. House the birds in a clean, warm coop (say a large box), sprayed well with eucalyptus. Give the bird five or six drops of the mixture, and, as a rule, three doses will effect a cure. If used pure the bird may die of suffocation. In bad cases the nostrils should be cleared by using a small glass syringe. Charge it with the mixture, or with Condy's fluid, and place the point in the slit in the roof of mouth, and drive the contents of the syringe sharply through the nostrils. If several birds have a frothy appearance about the eyes and a clear running at nostrils, pour a little eucalyptus oil on the surface of the drinking water.

Feed your birds well, and house them warmly, but allow sufficient ventilation. Where the poultry tick or bug infests the premises the next few months should be devoted to thoroughly exterminating them. Use a mixture of kerosine and oil. Abolish woodwork wherever possible. Do not confine your operations to the houses only—look in adjoining fences, brick walls, &c. The utter callousness of poultry-breeders here in reference to this pest has resulted in regulations being framed in Victoria debarring South Australian fowls from entering that State. Several breeders tell me that they have numerous birds which they could sell at from £3 apiece and more in Victoria. Here they say the buyers expect a first-class bird worth £5 in Victoria for as many shillings. Notwithstanding any statement to the contrary, the fact remains — the tick can be exterminated, and is, in my opinion, a mere circumstance compared with several garden pests. These wretched, careless people have brought the State into disrepute as regards poultry, and the careful breeders, who spend large sums in high-class poultry, and who keep their premises clear of vermin, are suffering loss of money I hope the day is not far distant when people will be compelled to keep their birds under sanitary conditions, and free from vermin. My advice is—do not keep fowls if you are unable or disinclined to erect decent houses for them. Roosting in trees is all very well; but the trees are liable to become infested with ticks, lice, &c. The methods and materials necessary to kill these pests will, as a rule, severely damage the trees. The very best tree I know of for a poultry-yard is the carob (Ceratonia siliqua), or locust bean tree. It has dense foliage, and very rigid, tough branches, and affords a very snug sleeping-place for the birds. Its smooth bark offers very little harbour for vermin of any sort. The beans are excellent for poultry, especially at this season of the year, mixed with the soft food. It is a difficult matter to grind them unless well dried, as they contain much gum, which clogs the mills.

Houses similar to those used at the egg-laying competition can be purchased in Adelaide for about 17/6. Larger sizes would be required for general use to hold. say 25 fowls. The sides are vertical, and the roof arched. The whole is rivetted, and the back also. The back is plain iron—the rest is corrugated. They are portable, but must be secured by means of stout pegs. or some kind of anchor. I approve of the pattern, and consider it well suited for country breeders. If necessary, a cat-proof front can be made, and have a small opening, with an iron slide to close at night. The tick has no chance in such a house. Several can be nested and packed so as to save freight. Any ironworker can make them, and the angle-iron perch frame is dispensed with, using framed hanging perches, and sinking the iron a few inches into the ground for stability. We used to make them of old corrugated iron tanks, and found them all right; but those specially made are more convenient, and of better appearance.

Do not forget to grow a good supply of green food for the birds this year. Thousand-headed and Jersey kail are a splendid standby, and may be grown without much trouble, if a moderate amount of water can be spared. We hope for a good year, and in good years, where there is plenty of grass about, poultry do remarkably well, so advantage should be taken of this state of affairs.

Save your poultry manure. Judiciously applied, it is a splendid fertiliser. Try a weak solution as a liquid manure for garden stuff of all sorts.

FARM HINTS FOR MAY.

By A. Molineux

All cereal crops should have been sown by the end of this month. The seed should be pickled with bluestone in every case, even although no signs of bunt or smut may be visible. Make the pickle with one ounce of bluestone to one gallon of water, and be sure that every part of each grain has been moistened with the pickle. Dissolve the bluestone in a separate vessel, and dip out from thence into the pickling tub. The practice of pickling on a floor gives no opportunity to remove any bunt balls from the seed, and as these are seldom soaked through by the pickle, the balls become broken in the drill or sower, and reinfect the seed. The better way is to pickle the seed in baskets partly submerged in the liquid, so that the bunt and foreign seeds may float and be skimmed off. After pickling, the seed should be kept at least 24 hours before sowing, else the effect of the pickle may be neutralized in the soil. Some adulterated bluestone has been sent to Australia, and farmers must make sure that they are not swindled with the rubbish. Pure bluestone is of a bright blue colour, and the rubbish is either greenish or partly white powder. If any seed is evidently bunted or smutty, make the pickle with 2 oz. of bluestone to each gallon of water. Suspend the bluestone in a piece of branbag near the surface of the water, else it will take much longer to dissolve.

There are several varieties of wheat that are rust-resistant and of good milling quality, as well as being prolific. It is not a wise thing to sow largely of rust-liable varieties. A few acres of some early kind might reasonably be sown to enable harvest operations to be commenced somewhat sooner than could be the case with the others, and so that the larger area can be harvested with fewer hands, but the major part of the land should be sown with varieties that can be relied upon to resist rust.

Every person who sells any kind of fertiliser is bound by law to give with each parcel a statement of its analysed constituents. There have been some vendors of manures who gave the phosphates and ammonia under different names in the one analysis, thus apparently doubling or trebling the value of an article that was not worth carriage to the farm. It is advisable to purchase only from traders who have some standing, so that they may be held responsible should the statement of analysis furnished be found to be incorrect. There can be no doubt that it is profitable to use somewhat larger quantities per acre than has been the practice with some farmers. It is advisable, also, to try some nitrogenous and potassic manures on small plots, because the time must inevitably come when such fertilisers will be necessary to the production of profitable crops.

It will pay all the time to grow some grain for the pigs, fowls, and other live stock on the farm. Whether it shall be oats, barley, or other grain, or even pulse, there should at least be several acres devoted to the purpose. The working stock must be kept strong and healthy, and this cannot be assured unless there is something besides the natural herbage for their support. The animal that has been at work all day must have some rest at night, and this cannot be secured if it has to be chewing dry hay or grazing on scanty herbage all night in the paddock. Pigs must be fed upon hard food for some weeks before being slaughtered else the pork will be of very inferior quality Hens will not lay well if they are not fed well, and even cows and sheep will do better when fed with a little crushed grain. Pigs can be raised to a certain stage upon lucerne, green barley, or any wholesome green stuff, but when shut for fattening they must have hard feed and dairy waste if available.

Peas should be drilled in rows 18 inches apart, at the rate of one and a half bushels per acre; if broadcasted at least two bushels per acre will be wanted and there will be trouble in harvesting the crop. Peas clean the land and enrich it in regard to nitrogen, which is the most costly of all fertilisers. The haulms of peas are much liked by stock, and the peas are valuable for every living thing on the farm. The crop may be stacked near the styes or feed racks, and thrown to the animals without threshing. Broad beans should be sown in rows 3 ft. apart, and kept hoed as long as it is possible to use the horses for the work.

Rolling directly after the seed is in will aid even and rapid germination of any crop, but when the plants are 4 in. high it is necessary to loosen the surface with the harrows.

Oats, tares, vetches, mustard, sunflowers, poppy for "maw," or bird seed, linseed, grass seeds, rape, and canary seed are amongst the many plants that will pay to grow in suitable localities; but it is of no use to recommend items that not one farmer amongst a thousand could be persuaded to try.

Prepare land at once by heavy manuring and deep ploughing for seeding with mangolds and beets. The short or globe mangolds are best for lands that are not deep, or sugar beets will probably do better in such localities. Rape will also be more certain to give a heavy crop if plenty of manure is ploughed in deeply before sowing.

ROSEWORTHY AGRICULTURAL COLLEGE NOTES.

FARM.

By J. D. Towar, Professor of Agriculture.

The work of reticulating the vegetable garden has been completed, the arrangements and location of the pipes having been made by Mr. Quinn. Provision is made for irrigating two acres. Plantings of all the usual winter vegetables have been made, and the promise of a supply for the College table is bright. The broad slope of light, warm soil facing the north will be utilized for a winter garden, while a level stretch of heavier land is being reserved for summer vegetables.

Attention is also being given by Mr. Quinn to the College surroundings. Broad strips of buffalo grass, with shrubs and flowers, will be planted. The future care of this portion of the farm will probably devolve upon the Superintendent of the vineyard and orchard, who will detail a third-year student each week to take immediate care of the grounds about the College buildings. The connection with the Barossa water supply will enable us to considerably improve the appearance of the place.

Seeding.—Operations were started in Dahlitz field on April 14, the 48 acres being sown to Cape barley. This field was sown to wheat last year, but owing to poor germination, and prevalence of weeds, it was ploughed up in September, rolled, and treated as bare fallow. The soil was in excellent condition when seeding was commenced this year, and on April 24 the growth was very promising. If the poppy appears again we will give a vigorous cultivation with the light harrows. Forty-nine acres of the "Island" is sown to oats, and 12 acres with a mixture of Cape oats and King's early wheat. About 1½ cwt. of superphosphate and 70 lb. of wheat per acre will be sown.

Forage Crops.—The prospect of plenty of feed during the winter months is very favourable. There is good growth in all the stubble fields, the second growth of sorghum is coming on well, and the seedings of rape made late in February and early in March are now making good growth. Wheat was drilled in on April 11 on about 16 acres of the sorghum paddock, and this is looking healthy.

Live Stock.—Generally the stock are in excellent condition. During the past season a number of light horses, as well as some of the old ones, have been disposed of, and three good, young draughts purchased. A valuable mare has succumbed with symptoms of colic and inflammation. On a post-mortem being made a considerable quantity of sand was found in the large intestines. The mare was away from the farm for about six weeks in October and November, being sent to a stallion near Kapunda, and on her return was much wasted in condition, though she improved slowly at the College Farm after her return. The dairy cattle have been receiving ensilage for some time, and there should be sufficient to carry them on until there is a supply of good grass for them. The young stock find good feed in the stubbles, and are in excellent condition. The sheep are in splendid condition, and we look for the first lambs at the end of April. Owing to the high price of grain we are disposing of most of the young pigs as weaners. By selecting the best young sows the breeding stock is being renewed. Some good young sows have been bred to the young Hawkesbury boar, while the older sows are being bred to another boar, and we are now able to sell pairs for breeding which come from unrelated strains.

EXPERIMENTAL VINEYARD.

By H. E. Laffer, Superintendent of Vineyard.

Within the last few weeks more new trellis work has been erected, and there is still a considerable amount to be done before pruning is complete.

The early rains brought on a fine crop of weeds, and these have been mostly killed by scarifying. As soon as the ground is sufficiently moist, ploughing will be started. The limestone patches in the vineyard and orchard have again yielded an abundant harvest of stones. These have been raked off by students, and converted into roads about the premises. Some of these stones, being of a considerable size, greatly retarded the team work, besides causing many breakages of implements. Owing to summer rains a second crop of wild melons came up, but unfortunately we were unable to root these out before seeding.

Layering of vines to fill blanks is now in progress, this operation absorbing a good deal of time. Three rows of vines on the sandhill were given a heavy dressing of silt out of an old dam. The tendency will be to make the soil heavier, and it will be interesting to see what effect this has on the vines. The silt is principally clay, with a high percentage of organic matter, and when dry is quite loose and open. It was applied about two or three inches thick, and will be ploughed in.

The young wines have worked out, and will soon be ready for the first racking.

A ton of apples will be made into cider this year, which we hope will be as successful as the previous lot.

Total rainfall to date, 4.36 inches.

ANALYSES OF FERTILISERS.

By W. L. Summers, Inspector of Fertilisers.

The following tables give the results of the analyses of various samples of fertilisers obtained by myself during the current season, together with the registered guarantee of the vendor:—

Mineral Superphosphates.

Vendor.	Brand of Fertiliser.	Water soluble Phosphate.	
		Guarantee.	Official Analyses.
		Per cent.	Per cent.
Geo. Wills & Co. ...	United Alkali Co.	36	37·7, 37·3, 36·6
Clutterbuck Bros. ...	United Alkali Co.	36	37·7, 37·3, 36·6
Clutterbuck Bros. ..	Packard's ...	36	39·2, 39 3, 39·3
Gibbs, Bright, & Co. ...	Ohlendorff's ...	36	37·5
S.A. Farmers' Co-operative Union	Ohlendorff's ..	36	37·1
S.A. Farmers' Co operative Union	United Alkali Co.	36	37·7, 37·3, 36·9, 36·6
Elder, Smith, & Co.	Lawes'	36	38·2, 38·7, 37·1
Wallaroo Phosphate Co	Wallaroo ...	36	36·8, 36·9
Australasian Implement Co. ...	Shirley's ...	36	36·0, 33·7, 33·8
Australasian Implement Co. . .	United Alkali Co.	36	38·9
Norman & Co.	Reliance ...	36	38 3, 36·9
D. & J. Fowler...	Eagle	29	29·9
D. & J. Fowler...	Lion No. 2 .	36	37·8, 37·3
D. & J. Fowler...	Green Lion ..	39	41·9, 43·0
D. & J. Fowler... ...	Rising Sun ...	39	42·3
D. & J. Fowler...	Tortoise ..	36	38·4
D. & J. Fowler...	Stork	36	38·3
Adelaide Chemical Works ...	Mineral Super ...	36	41·5, 41·3, 39·6, 44·3

General.

In this table the guarantee is shown in brackets after the official analysis.

Vendor.	Brand.	Official Analyses.
Norman & Co. ...	Scotia Thomas phosphate	Acid soluble phosphate, 29·5% (30%)
Norman & Co. ...	Reliance phosphate ...	Citrate soluble phosphate, 19·9%, 20·1% (20%)
Aust. Implement Co.	Swan Thomas phosphate	Acid soluble phosphate, 28·8% (30·5%)
Crompton & Son ..	Bonedust	Nitrogen, 3·26%, 3·2% (3·9); Acid soluble phosphate, 46·6%, 42·2% (44·67)
Conrad, L.	Bonedust	Nitrogen, 4·35% (3·6); Acid soluble phosphate, 41·5% (43·6)
Adelaide Chem. Works	Bonedust	Nitrogen, 3·4%, 3·71% (3·5); Acid soluble phosphate, 45·8%, 47·9% (45)
E. Anders & Sons ...	Victor Bonedust ...	Nitrogen, 4·35% (3); acid soluble phosphate, 42 5% (42)
Adelaide Chem. Works	Bone super	Nitrogen, 1·45% (2·1); water soluble phosphate, 17·7%, 19·9% (15·2); citrate soluble phosphate, 13·3%, 11·7% (15·8); acid soluble phosphate, 9·7% (6)
Adelaide Chem. Works	Guano super	Water soluble phosphate, 27·9%, 25·7%, 31·2%, 25·4%, 25·9% (20·2); citrate soluble phosphate, 4·2%, 2 6%, 2·6%, 3%, 2·9% (10)
Adelaide Chem. Works	Wheat manure	Nitrogen, 1·16% (1·05); water soluble phosphate, 28·4% (28·1); citrate soluble phosphate, 5·2% (5·9); acid soluble phosphate, 9·8% (6)
Adelaide Chem. Works	Super B	Water soluble phosphate, 32·9%, 28% (15); citrate soluble phosphate, 2·6%, 4·6% (15)
A. W. Sandford & Co.	Kangaroo Brand Guano ..	Nitrogen, 0·84%, 0 46% (1·5); acid soluble phosphate, 34·5%, 44·8% (35)

ORCHARD NOTES FOR MAY.

By Geo. Quinn, Horticultural Instructor.

The fruit harvest is practically completed for the season, and growers are now in a position to estimate the results of their labours. The value of experimental work, now that the successes and failures may be looked at from all sides, can be more accurately assessed. In experimental orchard work this season arsenical spraying for the repression of codlin moth has monopolized most attention. On the whole the results appear to have been highly encouraging, and consequently increased attention will doubtless be paid to it next year.

With the fall of the leaf we turn to the subject of planting. Owing to the favourable results following upon the spraying referred to there has been a renewal of hope for the apple producer. This is shown by the increased number of enquiries made by intending planters. The autumn is the best season in which to transplant deciduous fruit trees in South Australia. This particularly applies in those districts receiving not more than 25 in. of rainfall annually. This is due to the fact that the trees set out while the soil is yet fairly warm, and moderately moist, will make roots immediately. These roots become dormant as the ground reaches a wet and cold condition, but they have partly regained that balance with the top which existed before the trees were lifted from the nursery beds. With the return of warmth to the soil autumn-planted trees are thus better equipped to start into growth than those planted in the dead of winter. It is not necessary to wait for all of the leaves to fall before transplanting the trees. If the growth has ceased, and the leaves will part from the twigs without much force, the trees may be lifted. The best results are obtained from trees possessing one season's growth from the bud. To put the matter plainly, the dormant bud which started to grow in spring, and grew on through the summer, should make a good tree by the autumn. Choose smooth, clean, barked specimens, with the buds plump, healthy, and evenly distributed around the main stem.

When about to plant prune the roots, carefully removing all broken pieces, and prepare the soil so that the roots may be placed in a natural position. The tops should be pruned down pretty short. Stems more than 2 ft. high are not desirable in our hot, windy climate. In most positions 1 ft. of clear stem is preferable. If side branches have been formed in the nursery they need no be retained. In the case of peach and apricot trees it is desirable that they be suppressed against the main stem, but care must be taken not to cut away the base buds, which may usually be seen where these arms join the stem.

While it is desirable to curtail the number of varieties of any fruit, the planter should always remember that if he sets out, say three kinds of apples only, he is taking a risk in that they may all fail to carry a crop during the same season, or one or more of them may prove unsuited to the special local conditions. For this reason every apple orchard of 10 acres should contain at least half a dozen standard varieties. Owing to the susceptibility of the Cleopatra to fungous diseases and "bitter pit," apple planters in wet, cold districts will do well to avoid it. The London Pippin is a good substitute under such conditions. The Dunn's Seedling suffers somewhat from cracking around the stalk when grown in localities favoured with many summer or autumn showers, but otherwise it can be recommended for all parts. Jonathan and Rome Beauty should be in all orchards. Strawberry Pippin cracks under the effects of cold autumn rains, but otherwise is a good apple. Newtown Pippin and Esopus Spitzenburg also deserve attention. Scarlet Nonpareil, if thinned, makes a splendid fruit, and we cannot afford to despise the old Stone Pippin. The long-keeping qualities of Nickajack, Rokewood, and Shockley are also worth bearing in mind when making a selection. These three mature too late for the London market.

With persons just starting to plant an orchard there is a tendency to attempt to set out a great many trees during the first season or two. This usually leads to inferior preparation of the soil. Most of the soils in our best fruit districts need deep preparatory tillage. By breaking the ground deeply, but still keeping the surface and subsoils in their respective natural position, many advantages are secured.

The summer rains have brought the runners on strawberry bushes well forward, and intending planters should lose no time in securing and setting out the young plants. These plants like deeply prepared, rich, well-pulverized soils, and a good dressing of farmyard manure or bonedust should, if possible be worked in before they are set out.

The pruning of plumtrees will be well in hand during May. The older trees that are full of small, twisted spurs and laterals will yield fruit of improved quality if such wood be reduced considerably by thinning. Vigorous trees of a fruit-bearing age should receive very little winter pruning, as such treatment only aggravates their usual scanty-bearing habits.

In the districts with a small annual rainfall, say up to 30 in., no time should be lost in ploughing or digging the soil up roughly to absorb all the available rain. In dry localities, wherever storm waters may be secured from adjoining lands, the trenches should be put in order to conduct it into the plantation in the safest and most expeditious manner. In districts receiving heavy rains, and more particularly on hillsides, it is not desirable to follow this practice so early in the season. A growth of vegetation which will hold the soil, but be turned under at a later period, is more desirable. The present is a good time to work in coarse farmyard manures or slowly dissolving fertilisers, such as bonedust or kainit, and muriate of potash, which contain injurious substances in their composition.

NOTES ON VEGETABLE GROWING FOR MAY.

By Geo. Quinn, Horticultural Instructor.

On the open country, of which the plains of Adelaide are fairly typical, the summer and autumn have proved favourable to the growth of early winter vegetables. At the same time the true summer sorts have not matured as well as during most years. Tomatoes are practically flavourless, while melons and cucumbers have lost their charm with the early advent of cool nights. All kinds of marrows, pumpkins, trombones, and pie, or preserving, melons should be harvested, and placed away in safe places where there is not enough moisture to cause them to decay. In the open garden sowings should be made of carrots, parsnips, turnips, radishes, cress, red beet, spinach, parsley, broad beans, and onions where they are intended to remain. All of these should be sown in drills for the convenience of hoeing and weeding. When deciding upon sowing these crops the planter should set those kinds which will last through the summer in such positions in the beds so that they will not interfere with the economic working of the remainder of the land when summer vegetables are to be planted in it. Parsley and onions, for instance, will not be removed before the summer-growing vegetables are planted. The growth of weeds, more especially in land fertilised with stable manure, is very great, and unless prompt measures are taken at the outset the crops will be injured considerably. Growing crops of beets, parsnips, turnips, and carrots need thinning, and peas require to be supported by stakes or netting. The hoe should be used frequently to stir the surface between the crops, and occasional sprinklings of soluble manures, such as sulphate of ammonia or superphosphate, spread around the plants either just before hoeing or when rain is falling.

Successional plantings of cabbage, lettuce, cauliflower, and celery should be made to keep up a regular supply. Sowings should be made of cabbage, cauliflower, onion, and lettuce in prepared seed beds. These will come in for successional plantings in early spring.

The yellow matured stems of asparagus plants may be cut away 3 in. above the ground, and the surface of the bed dressed with well-decayed farmyard manure, and a good sprinkling of common salt. Where kainit is used the application of salt is not necessary. Rhubarb beds should also be overhauled, and where the plants are to remain the surface may be dressed with stable manure before being dug over. It is a good time to begin to trench ground for asparagus or rhubarb. Both of these plants relish deeply prepared rich soil, and are comparative failures if tried under other conditions. The ground should be trenched in a manner which will retain the subsoil in its natural

Another simple method occurred to me, which I have not had an opportunity to test, is displacement by the use of shot. With this method it should be possible to accurately test the graduations on the necks of bottles from the zero mark upwards by dropping into the bottles shot having a known displacement. As these two methods do not require the use of a delicate chemical balance, and being simple, inexpensive, and easily applied, I thought it might interest and benefit users of the Babcock tester throughout the State.

SOME CAUSES OF BAD BUTTER.

By G. S. Thomson, F.R.S.E., Government Dairy Instructor.

Dairying in South Australia has an encouraging outlook, and we predict big things in the future. That the industry is remunerative when conducted on proper lines is borne out by the fact that it is not uncommon to find farmers drawing over £40 a month for their milk supply to the factory. It must be accepted that the cow has been the salvation of the farmer in many parts of the State during the trying experiences of an unparalleled drought. The home has been maintained from the sale of the produce of the dairy. But these years of drought have not passed without leaving an influence for good, which will be of lasting benefit to the industry. To-day simple and inexpensive schemes of farm irrigation are in operation in many parts of the State with most encouraging results. Luxuriant crops of lucerne flourish on land hitherto unproductive in the dry weather; while sorghum and other forage plants are also more largely grown. Let us pursue this progressive system of cropping with untiring energy, and the dairy industry will be built upon a permanent foundation for success and profit. With a climate and soil in many parts unequalled for the production of choice butter, we have unquestionable reasons to extend the field of labour. Let us hope that this season will reopen our export trade with the British market, and that many prosperous years are in store; but it must be borne in mind that a renewal of our relationship with home buyers should commence and be continued by the shipment of the finest butter only. To accomplish this essential object we must overcome a weakness which is, unfortunately, too prevalent.

I have recently visited one of our principal dairying districts. I was sorry to find that the day's supply of cream at one factory was all of second or third quality. In some instances the cream was advanced in churning when removed from the farmer's dray, and to make the situation less excusable, the weather was favourable to the keeping quality of the product during the week of my visit. It might be asked what are the losses sustained by this wholesale neglect? The farmer receives a much reduced price for his cream, the industry is crippled, the name of the factory is exposed to permanent injury and financial weakening, and the manager—no matter how skilled he may be—suffers in reputation. I have no hesitation in saying that the best exponent on the science and practice of dairying in Australia is quite unable to avoid the development of injurious flavours in the butter produced from tainted cream. Permit the seeds of taint to enter the cream supply, and the few good organisms will be destroyed by the hurtful germs. A demonstration of result of carelessness of treatment of cream was given at the particular factory visited. Out of the total quantity of cream received (40 gallons), 160 lb. of low-grade butter was produced, resulting in a loss to the farmer of 5d. per lb., equivalent to £3 6/8 for the day's work. And that does not illustrate the full extent of the waste of money. Two cans of over-ripe cream gave a marked deficit in weight of butter, and upon analyses of the butter-milk and last washing water showed serious losses of fat due to the bad condition of the cream.

Taking note of the peculiar flavours, I proceeded to the farms to inspect the dairies, and the causes of the taints were soon ascertained. In a few cases the smells of the milk and cream rooms corresponded with the smell of the cream received from the farms. The majority of the dairies were being used for vegetables, meat, and sundry things, were badly ventilated, and otherwise unsuitable for storage of cream. One place was in a deplorable state—harness and old clothes hung in abundance, and the place was in semi darkness. Just fancy cream being collected once a day for four to seven days, and exposed to a contaminated atmosphere. Separators in some cases were being used twice daily, and cleaned only once. Whitewashing in most cases was out of the question.

To remedy this evil it is imperative for the farmer to keep the dairy for milk and cream only. Have the walls whitewashed frequently, secure pure ventilation, and plenty of sunlight. See that the separator is thoroughly washed after each use. Construct in the dairy a wire gauze safe as a protection against the invasion of flies. Keep each day's cream in separate dishes, and put together in cream can the night before sending to the factory. Cleanse the cream cans with cold water; then drench well with boiling water. By attending to these suggestions the dairyman will be pounds richer every month, and he will enable the manager of the factory to turn out an article creditable to the State.

CATTLE COMPLAINTS.

By T. H. Williams, Inspector of Stock, Mount Gambier.

In my opinion there has been a decrease in the number of cases of impaction of the omasum, dry bible, paralysis, "asthenic apoplexy," chronic indigestion, &c., in the South-East during the past few years. Twelve years ago many deaths were occurring about Bordertown, Wolseley, Narracoorte, Mount Benson, Millicent, &c., and I was frequently asked to inspect affected cattle, and suggest remedies. I had seen cases before coming to the south-east, and on commencing my inspections here I found all the characteristic symptons, viz., dulness, head and ears hanging, appetite and rumination suspended, eyes staring and bloodshot, tongue protruding, staggering movements, some animals rushing about for a time, as if mad, then falling over, and soon dying. My first post-mortems in the district were made on a farm near Wolseley, where seven milch cows had died in a few days, and three were sick. The autopsies in each case disclosed impaction of the omasum, apparently of long standing, as indicated by the hard dry cakes of injesta. Abomasitis (inflammation of the fourth stomach) was present in two cases, while in the others the stomach (abomasum) was flaccid, and had lost tone. There was effusion of bloody fluid into the brain cavity.

The treatment suggested was that laid down by Professor Barlow, but as a rule only Epsom salts was given, owing to the difficulty in procuring the other ingredients. The results were not very satisfactory, as the animals were not properly fed. Owners were trying many so-called cures, including drenches of tobacco, kerosine, &c., and, as might be expected, deaths were frequent. The pasture on which the cows referred to had fed was land that had been farmed for years, and grew none of the better class of deep-rooted grasses; the only water was an open dam, which was filthy, and smelt of the foeces discharged into it by the animals. This was pointed out to the owner, but he thought it good stock water; there was evidence, however, that the cattle were not drinking sufficient fluid to mollify the poor food they were eating. Later on I saw many cases where many post-mortems were made, and various stages and conditions of the complaint observed.

Milch cows are more prone to the complaint than dry cattle, owing, no doubt, to the extra drain on their systems, though the latter contract it readily where the water is impure, or when grazing on Yacka—grass tree—or dry sandy soils of poor quality, like much of the coast, where the grass dries off early, leaving a hard wiry stem deficient in nourishment. The heaviest losses have been on farms where all the land has been cultivated for years, and the natural grasses destroyed, their places being taken by various kinds of coarse weeds, which the animals would refuse if they could get grass. The food taken into the paunch when browsing is frequently of such a hard, wiry nature that the animals cannot again return it to the mouth to undergo rumination; consequently the contents of the rumen (first stomach) have not passed through one of the processes intended by Nature, but in an unprepared state passes into the omasum (second stomach), blocking that organ, and causing inflammation of its walls and leaves, as well as that of the abomasum in a percentage of cases. It is a common thing to hear of cattle on the coarse hard pastures losing the cud; they may be observed trying to return the food to the mouth, but nothing comes up, though the mouth goes through the cudding motion. This state is generally quickly followed by more marked symptoms of the complaint.

On sandy pastures sand, no doubt, plays a serious part in setting up inflammation of the stomachs and impaction. I have frequently broken up the hard cakes of injesta in water, and the result has been large deposits of sand—sufficient to indicate that the omasum contained from one to one and a half quarts. Sand in the abomasum is very common, and helps to paralyse the functions of the whole digestive canal.

Many cases of a chronic nature have been seen. An instance came under notice where 10 store-cows were removed from a sandy locality, where impaction, paralysis, &c., were common, to good grass pasture, 30 miles distant, where they were put with 40 head of other cattle. No cases of impaction had ever occurred here, and the 40 cattle all did well and fattened; not one of the 10 cows did any good, and three months after began to die, all dying within four months. Post-mortems showed the omasums to be wholly, or partly, impacted with hard cakes of injesta, which were tightly pressed into the folds, and looked as if they had been burnt. On being broken down in water quantities of sand, similar to that on the old pasture where they were brought from, was found.

Bad or insufficient water plays an important part in causing derangement of the digestive organs. On one of the commons in the district, where from 400 to 500 cattle run, the death rate used to be 30 per cent. The only water these cattle could get was in scooped out holes; it became very foul, and smelt of animal discharges. I have watched the cattle wade into the holes, stir the water up, smell it, and go away without drinking. In a short time they would return, but never drink sufficient water to mollify the food in their stomachs. Many post-mortems were made, and the omasums found dry and impacted—and the abomasums in some cases—inflamed, and the walls and folds thickened. Areas of inflammation were also found in the intestines in several cases. Pure water is now supplied from troughs, and few deaths occur. The same conditions have been observed in other parts of the district where the water was foul. The bacteria of malignant oedema has been found on slides prepared from the scrapings, &c., from the stomachs of animals affected with inflammation and thickening of the walls and folds. There was some doubt at one time whether bovines suffered from malignant oedema, but veterinarians now say it frequently occurs, and it is not unlikely that some of the cases of inflammation of the abomasum, &c., which have been observed in other parts, may have been caused by bacillus of malignant oedema, or other bacteria which would enter the stomachs in millions when the animals are forced to drink water contaminated by decomposing animal matter, or when grazing over land that has become foul. On farms where the complaint is common many of the animals—sometimes all—are affected with what some authorities call "pecka," or a craving after all sorts of unnatural food; they may be seen eating bones, old boots, bark, dead rabbits in various stages of decomposition, &c. These cattle have a pinched appearance, their coats are dry and staring, and the horns white and dry, and there is an unthrifty and imperfectly nourished look about them.

About twelve years ago this complaint in cattle received the attention of the authorities in Holland, where cattle on the sandy dunes and other poor land suffered. Scientific investigations were made by veterinarians, and their opinions were that the animals' systems were imperfectly nourished, the vegetation on which they lived being deficient in albumen, protein, and phosphates. They found the bones of affected animals light and dry, a given measurement of bone weighing only about half as much as a piece of similar size from an animal which had been reared on rich pasture, where Nature had been fully supplied with all it needed to sustain it in vigour. They also found that in proportion to the lightness of the bone frame the muscular system was affected, the tissues being deficient, soft, and flaccid.

Again, in England, we are told by those who have investigated the matter, that cattle constantly grazing over land will exhaust its various properties in the same way as continuous cropping will, and such land will not sustain animals in health and vigour. They suffer from impaction, general weakness, and paralysis of the digestive canal. In America the complaint, in all the forms we have it here, was common over extensive areas of pasture, and caused heavy losses. Investigations showed that the need of pure water and sound pastures was the cause. It was about this time that molasses began to receive attention as a suitable food for cattle, experiments having proved that cattle fed on food to which it was added did not suffer from the complaint. Molasses is extensively used for fattening cattle where they could not be kept with profit before.

About 10 years ago I realized that treating the complaint, as it occurred in individual animals, was anything but satisfactory, and that steps were necessary to prevent it Seeing that cattle on rich, sound, nourishing pastures, with plenty of pure water, did not suffer, I urged a better and more careful system of feeding and watering. Salt and sulphate of iron—10 to 1—were mixed and sprinkled over each layer of hay, straw, or grass as stacks were being built. As far as possible open waterholes were fenced off and troughs used, salt and sulphate of iron being put in the water daily. An improvement was soon noticed in the stock on many farms. On one in the Narracoorte district, where 30 cows died of the complaint, the owner stated recently that he had only lost four in the last seven years. If a beast looks mopish he at once gives a drench of ½ oz. of sulphate of iron, 1½ lb. of salts, and 1½ lb. of molasses in a gallon of water as hot as may safely be given. Salt and sulphate of iron are kept in the drinking water. As molasses began to receive attention in other parts of the world I urged its use by our farmers, and the result has been satisfactory. At first it was given as a drench only—12 to 16 oz. salts, 1 to 2 lb. molasses, in 1½ gallons of warm water. Many animals recovered after this treatment, but great care was necessary in feeding after, or the trouble soon came on again. Bran mashes should be given. The best feed for milch cows, in my experience, is 10 lb. soaked chaff (in hot water if convenient), 2 quarts bran, 1 lb. of molasses. If this is given twice a day a cow will yield a good percentage of butter, and keep in good condition. No trace of paralysis of the digestive organs or impaction will be seen. A few years ago a well-known farmer had 40 cattle and several hundred sheep in his paddocks, which got very bare early in January. Several cases of impaction occurred, and he spoke to me about the matter. He had straw stacks, and I suggested molasses and straw. A ton was obtained, and the whole of the cattle did well—some fattening. When owners have not had straw, &c., to put the molasses on for feeding, it has in many instances been given in the drinking water, and the results have been most gratifying, the animals taking to it with a relish. Some farmers now say they do not fear "dry bible," paralysis, &c. The nourishing properties of molasses have recently been shown in France and other parts of the world, where the veterinary officers in charge of the army horses gradually withdrew the supply of corn, and substituted molasses on peat moss, &c., up to 3 lb. of molasses per day. Dr. Hollrany speaks of molasses as the cheapest cattle food obtainable. Bullocks got up to 4 lb., and cows 2½ lb. daily.

In several localities in the south-east, where land is of a swampy nature, and poor in quality, cows cannot be kept with profit, owing to the prevalence of the complaint in all its forms. On some of these farms bonedust and sulphate of iron have been used, and grasses laid down, the result being that all trace of impaction has disappeared. Many farmers are keeping fewer cattle on their farms than formerly, and are feeding them better, with more profitable results.

There is a belief among farmers, on poor and rough country and worn-out farms, that the offspring of their cows, after a few generations, become predisposed to the complaint, and it is this class of young stock in which we have paralysis. On some farms the old strain of stock has been got rid of and new blood obtained, and they are doing well under rational treatment and feeding. From what I have seen of the complaint in its various forms in this district—the south-east generally—and I have seen hundreds of cases, I am quite sure it is not an infectious or contagious disease, nor is there any mystery about it, from the fact that when animals have plenty of good nutritious food and pure water they do not suffer. I am aware many will say "Cattle do suffer when there is plenty of feed." My reply is—"Yes; they do, in localities where they get quantity but not quality," the feed being deficient in phosphates, protein, &c.

Molasses, &c., for Stacks.—For a 25-ton haystack take 20 lb. sulphate of iron, 200 lb. of salt, and ½ ton of molasses. Add sufficient water to the ingredients to make it liquid enough to run through ¼-inch holes from a watering can. For a grass or straw stack of similar size add an additional ¼-ton of molasses. A couple of boys can spread the mixture over the layers as the stack is being built. In this district the first cases of the complaint occur about the middle of November, when the wild oats begin to dry off. Cattle owners should therefore commence to put molasses, sulphate of iron, and salt in the water early in November, and this should be seen to every day.

DEPARTMENTAL NOTES AND WORK.

The first session of the Roseworthy College year opened on the third Wednesday in April with 50 students on the roll, and three or four more likely to enter shortly. There are at present 13 third-year students, 17 second-year, and 20 first year.

Mr. Thomson and Mr. Quinn have assumed charge of the classes in dairying and horticulture respectively. In addition to lectures, the students will receive good practical instruction in the various branches of the above subjects.

During the month ending April 27 2,390 cases of fruits and 32 packages of plants were admitted into the State. Eleven cases of bananas were destroyed owing to over-ripeness, and four parcels of plants destroyed on account of not being accompanied by declarations respecting the absence of phylloxera in the place from whence they originated. The Inspectors have certified to 12,508 cases of fruits, 14 parcels of plants, and 2,500 packages of vegetables for export to States demanding the departmental certificate of freedom from diseases The imported fruits consisted of bananas, pineapples, and passion fruits, the exported of 16 kinds of locally grown fruits, of which grapes and apples were sent away in large quantities.

The harvesting of pip fruits has been pretty well completed in April, and the Inspectors, who have been engaged visiting codlin moth infected orchards, have completed their busy season. Between March 24 and April 18, Inspector Kelly reports having paid 42 visits to orchards and gardens in the Stanley districts during six days on which he has been working. In the Mount Lofty Ranges Inspector Monks has spent 17 days inspecting orchards, and has made 200 visits during that time. Inspector Trimmer has worked 17 days during the month, making 140 visits to orchards and gardens in the Barossa district. These officers report excellent results from the adoption of arsenical spraying in many of the commercial orchards in their respective districts. In the Coonawarra district Inspector Pounsett has devoted 11½ days to the orchards, making 127 visits during the month.

During April Mr. Quinn has visited orchards at Sandy Creek, and inspected land in that locality respecting its suitability for fruit culture. Further shipments of fruit to London and Hamburg were inspected at Port Adelaide before being placed on board. The laying out of the ornamental grounds around the College has been taken in hand, and fair progress is being made towards beautifying the approaches. The vegetable garden at the College has been sown and planted with seasonable vegetables under Mr. Quinn's direction, and steps have been taken towards replacing the trees that have died during the past summer.

COUNCIL OF AGRICULTURE.

The monthly meeting of the Council of Agriculture was held in Adelaide on Wednesday, April 29, all the members but Messrs. J. Murray and A. D. Bruce being present.

The Minister of Agriculture intimated that matters in connection with the Agricultural Bureau, which were formerly dealt with by the Central Bureau, would in future be submitted to the Council.

An application for permission to form a branch of the Agricultural Bureau at Wepowie, about 13 miles from Orroroo, was received, and it was decided to approve of same subject to suitable persons being nominated for appointment by the Council.

The appointment of the following gentlemen as members of the Bureau was approved:—Clare, Messrs. J. H. Knappstein and Greenway; Mount Compass, Messrs. F. De Caux and L. Klauss; Koolunga, Mr. H. Butterfield; Woolundunga, Mr. Bently; Clarendon, Mr. T. B. Brooks. It was decided that in future the occupations of the gentlemen proposed as members should be stated.

Mr. Dawkins reported that the College Committee had met at Roseworthy the previous afternoon, and had passed certain resolutions dealing with the departmental matters. It was decided to forward resolutions to the Hon. Minister requesting that effect be given to them.

Mr. Miller, Chairman of the Committee on Agriculture and Stock, stated that the committee had met to consider replies to circular re stock complaints. The Chairman reported having carefully perused the 69 replies returned (out of 2,000 sent out), together with the reports from Stock Inspectors, and having prepared a short digest of the replies. After discussion it was resolved that the Chairman be thanked for the care and trouble taken and that the Chairman's report, together with replies to the circular, &c., be forwarded to Dr. Ramsay Smith with a request that if possible he should report thereon before the next meeting of the Council.

Miss A. L. Tomkinson wrote urging the necessity for affording women an opportunity of securing a practical education in agriculture, horticulture, &c. Members referred to the good accomplished in other parts of the world by giving women facilities for study in these subjects, and it was decided to ask Professor Towar to report on the lines on which similar work is carried out in America.

Mr. Krichauff said he had received a letter from a former resident of South Australia calling attention to the opportunity afforded by the great international exhibition to be held at St. Louis, U.S.A., in 1904, of advertising South Australia, and inducing men with money to settle here. A representative collection of our products would do us a lot of good. The Secretary was instructed to make enquiries as to whether the Government intended to do anything to have South Australia represented.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report, May 1st, 1903—"The best general rains for ten years" is reported from country districts in South Australia, and especially emphasized from such parts as have experienced a continuance of seasons more or less droughty since '95. Creeks are running, and flats covered with water that have been dry for years past, justifies the belief that the long cruel drought has broken up at last in the usually drier agricultural districts, and gives promise of a return to, at least, normal climatic conditions and average seasons. Growing feed is abundant in many parts, and giving good promise in other places, so that the outlook altogether has much improved pastoral matters throughout Australia.

With the trading community business is, generally speaking, sound; though a few small storekeepers in country districts that have suffered so severely are being forced to wind up or reconstruct. Since the excitement over the exaggerated Arltunga gold discoveries has subsided there seem to have been some reefs opened up in the district that will probably pay to work; and there is a growing belief that extensive deposits of low-grade, if not rich, gold ore may be expected over large areas in Central Australia. The Barrier silver-lead mines are wearing a healthier look, and increasing their operations, and as copper, though weaker, is still maintaining a better average value than it did during some years recently, the mining industry can be reported as showing fair prospects of increased prosperity.

Generally favourable climatic conditions in the Northern Hemisphere have kept values in breadstuffs there nominally unchanged, but the market has lacked animation. In California wheat has eased a bit in consequence of the stoppage of purchases on Australian account, and a lessened demand from South Africa, but these are about the only changes noticeable during the month in the trade on that side. Heavy buying orders, however, from Australia are being placed in Argentine, the first cargo, ex steamer Fernley, of new season's wheat from that country now being discharged in Sydney, the quality of which is so well reported on that the further needs of these States will be doubtless drawn from that source, already heavy cable orders having been sent. In Australian wheat, which practically means South Australian now, business has been very light in Sydney pending arrival of the South American cargo referred to, but there has been a better demand here from Melbourne, where millers seem unable to get along just now without our hard wheat. Locally business has also been better, Adelaide millers paying slightly enhanced prices. There has been no outside demand for flour, but as bakers at the beginning of this season bought only short supplies, most of them are again operating, so that local trade is fairly active, values continuing firm at previous month's closing top quotations. Fodder lines have been in good request, but millers' offal has slightly eased in consequence of Western Australia, our usually best outlet for bran and pollard, being now supplied from New Zealand and India; export business now being restricted to fulfilling previous sales, though local consumption has been quite up to usual. In chaff the market has been very active owing to Sydney buying freely, but during the past week, since the rains, there has been a slackening off. Feeding grains have well maintained, Cape barley only showing a slight easing since the competition of demand for seeding.

To the cheapness of potatoes this season, compared with the price of bread, may be attributed partly, at least, the increased consumption of this favourite tuber. Record deliveries have been made by rail from the Mount Gambier district, the city, as well as country distributors, buying freely, whilst a steady export trade with Western Australia has been maintained, and heavy shipments now being made to Sydney, where quotations show a fair margin of profit to shippers. Though crops continue to dig well there need not be any fear of this State having an unmarketable surplus this season if no check upon the export trade is given. The quality of our potatoes apparently satisfies Western Australian consumers, if we may judge by their willingness to pay higher than Victorian quotations for South Australian samples. Onions also are being freely dealt in, and although there does not seem to be much prospect of an advance in price in the near future, stocks are likely to be steadily reduced by good local and export demand. Values in both eased slightly at beginning of month and thus assisted in maintaining our export trade in competition with Tasmania and Victoria.

The worst fears of dairy people have been realized in that, instead of the usual seasonable advance in value for their new butter, price has actually gone back at a time of year when supply is falling off and the cost of production being increased. In Victoria quite a collapse in price occurred, and a low but very unsatisfactory market ruled during April, though a slight, and it is to be feared only transient, improvement at moment is showing. This trouble is, of course, the direct result of the heavy speculative stocks of spring and early summer packed butter, which is held throughout Australia. The genial season has also contributed, no doubt, to bring about this condition, but even if a dry winter had been experienced it is believed the speculative holdings were far heavier than ever likely to be needed. Values here, however, have ruled quite 25 per cent. higher than in Melbourne. Export demand for eggs has been ahead of supply, so that price steadily advanced throughout the month, excepting for the usual lull that occurred when the export orders for Easter trade had been filled, but the check in upward trend only lasted for a couple of days, when advancing tone resumed, and values now show strong tendency to still higher rates. In bacon good business is being put through at improving quotations. A full turnover done in cheese, but prices again had to give way under the influence of cheapening rates in Victoria. Honey continued in good demand, values stationary. Beeswax easier. Brisk sale for almonds.

In poultry April business shows a decided improvement upon preceding months, even poor-conditioned birds selling much better, though with the present dearness of fowls' feed it would be easy to glut the market again with poor stuff. Values all round show satisfactory advance, excepting for pigeons, which are nearly unsaleable.

The cool season having set in there is excellent demand for carcase pork and veal. Values are good, though it must not be expected prices will rule quite as high as last winter.

MARKET QUOTATIONS OF THE DAY.

Wheat.—At Port Adelaide, shipping parcels, 5/8 f.o.b.; farmers' lots, 5/7 on trucks, per bushel, 60 lb.

Flour.—City brands, £12; country, £11 12/6 to £11 15/ per ton 2,000 lb.

Bran.—1/2¾ to 1/3. Pollard, 1/6½ to 1/7 per bushel of 20 lb.

Oats.—Local Algerian and Dun, 3/; prime stout feeding Whites, 3/ to 3/3 per bushel 40 ℔.

Barley.—Malting, 4/6 to 4/9; Cape, 3/9 per bushel, 50 ℔.

Chaff.—£5 7/6 to £5 12/6 per ton of 2,240 ℔., bags in, f.o.b. Port Adelaide.

Potatoes.—Gambiers, £2 12/6 per 2,240 ℔.

Onions.—Local, £3; Gambiers, £2 15/ per 2,240 ℔.

Butter.—Creamery and factory prints, 1/1 to 1/3; private separator and best dairy, 1/ to 1/1; well-graded store, 10d. to 11d.; Victorian new bulk, 10d. to 1/; stored, 9d. to 10d. per ℔.

Cheese.—S.A. best factory, 6d. to 7d.; ordinary, 5d. to 5½d. per ℔.

Bacon.—Factory-cured sides, 8½d. to 9d.; farm flitches, 6d. to 6¾d. per ℔.

Hams.—S.A. factory, 9d. to 9½d. per ℔.

Eggs.—Loose, 1/5½: in casks, f.o.b., 1/8 per dozen

Lard.—In bladders, 7d.; tins, 6½d. per ℔.

Honey.—2¾d. for best extracted, in 60-℔. tins; beeswax, 1/½ ℔.

Almonds.—Fine softshells, 4½d. to 5d.: kernels, 10d. per ℔.

In live poultry heavyweight table roosters fetch 1/9 to 2/4 each; plump hens and cockerels, 1/3 to 1/7; light and poor birds, 11d. to 1/; ducks, 1/4 to 2/; geese, 2/6 to 3/3; turkeys, from 5d. to 7d. per ℔., live weight, for medium to good table birds.

In carcase meat choice shop porkers sell at 5d. to 5½d.; good baconers, 4½d. to 5d.; prime veal, 3½d. to 4d.; medium to good, 2d. to 3d.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, flour, and forage, for export are f.o.b. prices at Port Adelaide. Dairy products are city auction mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

With a view of publishing in the "Journal" the dates of meetings of the branches of the Agricultural Bureau, Hon. Secretaries are requested to forward dates of their next meeting in time for publication.

Branch	Date of Meeting.		Branch	Date of Meeting.	
	1903	1903.		1903	1903.
Balaklava	May 9	June 13	Mount Remarkable	May 7	June 4
Booleroo Centre	7	9	Nantawarra	6	10
Brinkworth	1	5	Norton's Summit	8	5
Burra	8	12	Onetree Hill	8	5
Cherry Gardens	12	9	Paskeville	9	—
Clare	8	5	Penola	9	13
Colton	2	6	Pine Forest	5	—
Crystal Brook	9	—	Port Elliot	16	20
Eudunda	11	8	Port Lincoln	15	19
Finniss	4	1	Port Pirie	9	—
Forest Range	7	4	Red Hill	5	—
Gawler River	8	5	Reeves Plains	—	5
Hartley	8	—	Rhine Villa	8	6
Inkerman	5	9	Riverton	9	6
Johnsburg	9	6	Saddleworth	16	20
Kanmantoo	8	5	Strathalbyn	18	15
Kapunda	2	6	Swan Reach	9	—
Kingston	2	6	Wandearah	11	8
Koolunga	7	4	Whyte Yarcowie	16	20
Lyndoch	7	—	Willunga	2	6
Maitland	2	6	Wilmington	6	10
Minlaton	16	13	Woodside	4	—
Morgan	9	6			

AGRICULTURAL BUREAU CONFERENCES.

NORTHERN BRANCHES.

The Annual Conference of the Northern Branches of the Agricultural Bureau was held at Crystal Brook on February 13. The following members of the Bureau were present:—Messrs. Davidson, Miell, Hutchison, R. and P. Pavy, Hamlyn, Venning, B. and M. Weston, Symons (Crystal Brook), Dunsford, Satchell, Smart, Darley, Turner (Narridy), Johns, Wilson, Jose, Spain, Bell (Port Pirie), Warnum, Gallasch (Gladstone), Hewett, Lehmann (Caltowie), Munday, Birks, Robertson, Stanley, Dick, Davidson (Wandearah), Gardiner, Angley (Mundoora), Nicholls, Lithgow, Steele, Torr (Redhill), Stone, Kingcome (Port Germein), Dowd (Whyte Yarcowie), and Smallacombe (Petersburg).

Professor Towar, Mr. George Quinn, and Mr. G. S. Thomson represented the Department of Agriculture.

Mr. R. Pavy (Chairman of the Crystal Brook Branch) presided, and welcomed the visitors.

SPECIALIZATION IN FARMING.

Mr. T. A. Wilson, of Port Pirie, read a paper on specialization versus combination in farming. He said that for years past the farmers of South Australia had been strongly urged not to put all their eggs in one basket, but so order their work that they would have money coming in all the year round. This advice had been followed to a large extent, and doubtless had resulted in the present improved conditions of some farmers, but he thought it was against the best interests of the State, as the "combination" farmer is even now behind the times in many of the lines he deals in, and would be still more so but for the efforts of the specialists in certain lines whose work he reaped an immediate benefit from. To spread one's attention and effort over a large field of industry must result in mediocrity, and he contended that the time had come for agricultural authorities to urge the farmers to specialize in certain branches. Take the world over the march of progress was due to the efforts of specialists. The high standard of their stock, their crops, machinery, &c., were all due to the work of men who had made one branch a specialty. For an individual to achieve the best results he is capable of, he must devote the whole of his ability and energy to one line of work. The present status of agriculture was higher than formerly, and while it was possible to raise it still higher, the work of the combination farmer would only lower the standard. He strongly urged farmers to specialize and become expert in one particular line. He did not mean that they should not raise on the farm produce of various kinds, but these things should be quite secondary to the main aim. For instance, the wheatgrower must keep horses for his work, cows to produce milk and butter, sheep for mutton, and pigs and poultry to consume the waste products: but the main aim should be to improve and increase the quality and yield of wheat. So with the horsebreeder, the dairyman, the sheepfarmer, &c.

Members generally disagreed with Mr. Wilson, the main view being that it was unsafe to rely mainly on the one line, and that specialization was costly and risky for the average farmer. Several stated that they had tried wheatgrowing alone, but without success. One paid all his store bills with the products from his poultry; others had found sheep an absolute necessity to successful farming. A vote was taken on the subject, with the result that a practically unanimous adverse show of hands resulted.

WATERING AND CULTIVATION OF THE SOIL.

Mr. G. Quinn (Horticultural Instructor) delivered an address on "Watering and Cultivation of the Soil" as applied to fruit trees. He remarked that in warm countries with a small rainfall the most luscious fruit could be obtained by judicious irrigation—the conservation and distribution of water. Discretion should be used in the application of water, because too much would probably do more harm than none at all. If the supply was limited special care should be taken to hold what moisture there was by careful cultivation and treatment of the soil. Astonishing results could be obtained by taking every advantage of the rainfall. He advocated rough, deep ploughing early in the season and the provision of drains so as to secure surface water from neighbouring areas. and the important fertilising constituents which it contained. The winter water should be conserved. It was advisable to make trenches around the trees about 9 or 10 in. deep, and manure them, and, after allowing time for soakage and drying until the soil became workable, to fill them in, and loosen the surrounding ground well. The Arabs, from whom they could learn a good deal in the direction of irrigation and cultivation, opened up the ground between the trees deeply in the winter months, and banked up the earth immediately beneath the foliage, placed manure and other organic matter in the trench, and in the cool season replaced the soil. Where only fair quantities of water were available the ring or basin system had proved the most suitable. The idea was to make a ring or basin around the spread of the foliage of the tree, and pour water into it. Where the supply was abundant the furrow system was superior to the open flooding method, as it had a lesser tendency to spoil the mechanical texture of the soil. The furrow system consisted of making four or five furrows between the rows of trees so that the whole area received moisture. The roots of the trees were induced to spread out over a wider feeding area. With a view to keeping the roots down in the more permanently moist and cool layers of soil the rings, trenches, or furrows should be made a good depth—say 10 or 12 in.—so that the water would be placed in direct contact with the roots. If that method be followed by deep and thorough pulverization of the surface soil such a result would be secured. The tendency of a surface mulch of organic matter was to draw the roots nearer to the surface than where dust mulches were adopted.

THE AUTO-MOBILE ON THE FARM.

Mr. A. Miell, of Crystal Brook, read a paper on this subject. Throughout the drier portions of Australia farmers frequently experienced great difficulties in providing fodder for their working stock, and this leads one to consider whether it is not possible to largely supersede horses with traction power. The various magazines had been telling of the work done in this direction in America, where steam traction has, on the larger farms, taken the place of horsepower for tilling and harvesting operations. Vast strides in this class of machinery had been made of late years, and some of the engines draw ploughs breaking up the soil to a width of 30 ft. at one operation. One great advantage of these engines was that a large area can be turned over in a short time. To the Australian farmer, whose ground rapidly becomes too dry and hard to plough properly, this was a very important item. The large harvesting machines drawn by the traction engines have reaped and bagged the crop on 150 acres in one day, eight men being required to work them. While such large machines would not be suitable to Australian conditions, there were smaller ones equally useful. The Field of November 23, 1902, speaks very highly of the work done by the Ivel agricultural motor, a British machine of eight horsepower. When at work the motor was drawing a plough at the rate of four miles an hour; it was very simple in construction, and can be worked by any intelligent man with a little instruction In ploughing it is claimed to do as much work in a day as two similar ploughs drawn by horses. The rate and regularity of speed, and the longer hours that it can be worked, are great factors in its favour. The motor had been previously used to draw reaping machines, binders, mowers, and also drawing wagons on the road. The cost of petrol was 8d. per hour for reaping, and slightly more for ploughing. The motor weighs under 17½ cwt., and the weight is distributed over three wide wheels, consequently it makes but little impression on the soil. The wide wheels give a splendid grip, no matter how soft or sandy the land may be. The cost of maintaining such motor—of which quite a number are now in use in Great Britain—would certainly not be more than the keep of horses required to do the same work, and when not in use it can be housed, and costs nothing to maintain. On the larger holdings of South Australia, the horse feed bill was a very serious item. Last year on his own farm the market value of the feed consumed was nearly £500, and his experience was by no means singular. Besides the actual cost, they were often reduced to desperate straits to keep their horses alive during periods of drought, and while he did not expect horses to be altogether dispensed with on farms, he was convinced that during the next decade the progressive farmers of Australia will advance with the times, and as horsepower for chaffcutting has been displaced by oil engines, so automobile machinery will displace horses for traction work on the farm.

Members were generally rather sceptical of the possibility of Mr. Miell's forecast coming true. The risks of fire were considered too great in such a dry climate, and the sandy nature of so much of our land was thought to be a serious obstacle in the way. Mr. Miell intimated that if the cost of the Ivel motors was reasonable, it was not improbable that the members might be afforded an opportunity of seeing what they could do in Crystal Brook district.

POULTRY.

Mr. H. B. Turner (Narridy Branch) read a paper on "Poultry." Fowls were like human beings, in that they are adverse to bad smells, draughty or ill-ventilated houses and overcrowding. Their comfort must be studied if they are to be profitable. The practice of allowing fowls to roost on the fences or in the outbuildings or stacks is a very bad one. Such birds are more liable to disease, and are a nuisance to other stock. The hay suffers considerably, and the stables become infested with vermin. Proper houses to hold not more than 40 fowls should be built. Where poultry are exposed to cold wet weather eggs soon reach the vanishing point, and, apart from other considerations, it will pay to provide warm houses for them. While almost any fowl will lay fairly well in warm weather with ordinary care, the main aim of the poultry keeper must be to find out which breeds will lay best in his particular locality during the cold weather, when eggs are dear, and to his mind the well-feathered breeds will usually fill the bill. They may not produce as many eggs during the year as the lighter breeds, but will produce more when prices are high. The most profitab'e hen was the one that laid most eggs in the winter months. He was a firm believer in pure-bred fowls for laying purposes, as these breeds had been specially developed for egg production, and the farmer has neither time nor skill to improve them. For meat produ^tion it was another matter; crossing of certain proved breeds gave a more satisfactory result than was secured from pure-bred animals. Any one who intends to make poultry profitable should not hesitate to pay a fair price for good birds for breeding. The food supply was another important matter. A variety of foods should be supplied; it was a great mistake to give only one class of food. In addition to grains of various sorts, green stuff, cut green bone, meat scraps, &c., should be fed. The drinking water must be clean and fresh, and kept in the shade. Sun-heated water will cause bowel complaints. Sick fowls, unless specially valuable, do not as a rule pay to doctor. Affected birds should be destroyed and burnt; or, if worth saving, isolated, and not allowed with the rest of the flock until quite healthy. He had noticed recently in one of the dailies a statement that the cost of egg production on a well-managed poultry farm would not exceed 2½d. to 3d. per dozen. In his opinion, this was not correct. It will cost 4/ per year to feed the hen, and to produce eggs at 2½d. per dozen she will require to lay 230 eggs a year, and then no account is taken for labour, interest, loss through deaths, &c. The same paper also states that plump chickens suitable for export can be reared at a cost of 11d. each, and weighing 3½ lb. to 5 lb. (dressed) at 14 to 16 weeks old. He felt sure there was a mistake here. At eight weeks old a chick will eat as much as a grown hen. To produce the weight stated the chicks must be fed specially at extra cost, and as far as his experience went it would cost 5d. to 6d. per lb. to produce meat. With the best of care birds will need to grow quickly to weigh 6 lb. to 8 lb. live weight at five to six months old. While he believed that with proper care and attention poultry keeping will pay, he would not advise any one to go in largely for poultry unless he thoroughly understood the business.

Mr. Hewett disagreed, and said after ten years' experience he found poultry paid well on the farm. The fowls do not cost as much as the writer stated. There were many waste substances on the farm which could not be collected by any others than the fowls, and these were returned in eggs.

IMPROVED METHODS OF DAIRYING.

Mr. G. S. Thomson (Dairy Expert) said during the past ten years there had been a great advance in the science and practice of dairying. Dealing first with the breeding of stock, he stated that in South Australia they had some very fine and valuable specimens of the cross Shorthorn-Jersey, which was the best for dairying purposes. They had in the progeny an animal which gave a large quantity of milk of high quality, and at the same time one with plenty of good flesh. Some people recommended a cross between a Jersey and Ayrshire, but the progeny was too small, and lacked constitutional vigour. The black and white Holstein cattle give as much as 1,000 gallons of milk a year, but it lacked quality, the percentage of fat being as low as 3.3. Therefore it was necessary to cross the Holstein cow with another type in order to increase the percentage of fat. During his extensive travels in Denmark he observed that special attention was being paid to maintain the cleanliness and purity of the milk. In Copenhagen he visited a depot where 5,000 gallons of milk were received daily; the employes worked under rigid regulations. Inspectors made tours of the different establishments, and breaches were reported to the authorities. The system of feeding in Denmark was different to that which obtained in South Australia. Animals were not allowed to roam about in fields or paddocks, but were tethered with given ranges of grass to consume. It was, therefore, necessary to train the cow to perfect docility. The quality of the milk yield in South Australia, was equal to that of any country in the world. In some of their districts cows yielded fat to the extent of over 5 per cent. Last season the records of one factory of 62 suppliers showed an average of over 4 per cent. of fat for the year—a remarkable average. While in London he tasted samples of Danish, Siberian, and Australian butter, and he was pleased to find that the article sent from Australia was superior. The Siberian product at present was of a poor quality, due, of course, to the fact that the industry was in its infancy. On the Continent every cow was brushed once a day, and that method had resulted in purer milk, which left the cowsheds without the faintest contamination. Encouraging results had been obtained by giving the cattle sunflower cake. It should be possible in many parts of the State to grow large plots of sunflowers, and more should be done in the cultivation of mangolds. In sending cream to Adelaide from northern butter factories deterioration was bound to take place. It would be a fine thing for the industry if the factories could be located in central positions, so that the distance of carting the cream might be minimised. It was a great mistake to believe that cream sent from Port Augusta or Mount Gambier to the city arrived in good condition.

Professor Towar emphasized the importance of daily grooming the cows and paying strict attention to cleanliness. The additional expense would be trifling after the practice had developed into a custom. It was worth while the farmers trying it, and he was confident that they would soon realize its value. Possibly the benefit would be greater in cold climates, where the animal's skin was not so open and porous as in a climate like South Australia.

ANALYSES OF SOILS.

Mr. Dowd, of Whyte-Yarcowie Branch, moved to the effect—"That the Government analyse different soils from the members of the Bureau, in order to enable the growers to use the right kind of manure for the soils, or as an alternative the Government supply sufficient quantities of manure for experimental purposes, in order to find out the most suitable kinds for each farm or district." Mr. Venning seconded, and Messrs. Lithgow, Dunstone, and Stone supported.

In reply to questions, Professor Towar said the subject had been much discussed all over the world. The results of analyses were not conclusive. If a necessary element were absolutely absent that would be shown by analysis. On the other hand, the analysis might show much potassium and still applications of that element may give good results in increased yields. The analyses would not show the physical condition of the soil, or the condition of the elements whose presence it showed. These were very important considerations. He could not say definitely from an analysis what to apply to the soil. if the presence of the necessary elements were indicated. Soil analyses were costly, and consequently wholesale tests were out of the question.

Mr. H. Nicholls (Narridy) moved an amendment—"That the Bureau accept as far as the Department is prepared to supply, manures for testing the various soils of the districts." The amendment was declared carried.

CONSERVATION OF SOIL MOISTURE.

Professor Towar gave an address on this subject similar in general to the address given at Brinkworth.

SOUTH-EASTERN BRANCHES.

The eleventh Annual Conference of the South-Eastern Branches of the Agricultural Bureau was held at Mount Gambier on Thursday, March 26. Professor Perkins (Secretary for Agriculture), Professor Towar (Professor of Agriculture), and Mr. G. S. Thomson (Dairy Instructor), represented the Department of Agriculture. The following members of the Agricultural Bureau were present:—Mount Gambier—Messrs. Mitchell (chair), Clarke, Lewis (Hon Sec,), Barrows, Wedd, Norman, Dyke Wilson, Watson, and Ruwoldt. Lucindale—Messrs. Feuerheerdt, and Langberg. Narracoorte—Messrs. Shinckel, Wardle, and Duffield. Millicent—Messrs. Harris (Hon. Sec.), Stuckey, Campbell, Holzgrefe (Chairman), Davidson, and Stewart. Penola—Dr. Ockley.

Mr. W. Mitchell, Chairman of Mount Gambier Branch presided, and after welcoming the visitors, called on Professor Towar for an address.

PLANT FOODS.

Professor Towar spoke on "Plant Food" on generally similar lines to his address at Mannum Conference. He referred to the various elements in the soils, and to their absorption by the roots of plants. The conditions required to make these elements available to the plants were dealt with, and the direct action of manures explained. The necessity for supplying the plants with soluble food was emphasized, and the action of certain classes of plants in obtaining nitrogen from the air noticed. He spoke strongly against the neglect to make the most of farmyard manure which. in addition to the actual food it contained, supplied a most important factor in soil fertility, viz., organic matter. He maintained that recent research had demonstrated that it was cheaper and better to apply farmyard manure direct from the stable than to rot it in pits or heaps. He had noticed that in various parts of the State, the manure was actually allowed to waste. However well off a farmer might be, and however rich his soil, he could not afford to waste the farmyard manure. Then amongst indirect manures that might pay to use in this district were salt, lime, and even clay and sand. He would not be surprised if on their peaty land it would pay to spread sand from the uplands. Then with many root crops, and grass lands, the application of salt will often pay. A number of questions were asked and answered by the Professor, whose address was much appreciated.

MERINO SHEEP.

Mr. S. Shinckel. of Narracoorte Branch, read a paper on "The General Management and Care of Merino Sheep.' He had had considerable experience in the management of sheep in the south-east, and favoured the strong woolled sheep, as a farmer got a large framed animal and a heavy fleece. The farmer starting would do well to purchase cast-off ewes from a good flock. These were usually sold cheap, on account of their age, but the farmer could get one or two good lambs, if care is taken of them. If young ewes are purchased; they will mostly be culls. Particular care must be taken to secure good rams, they should show no weakness in the fleece, and carry strongly developed the characteristics desired in the flock. Efforts should be made to get the flock regular in character, and keep developing along special lines.

Rams should not be allowed to run the whole year with the flock; taken all round April and May were the best months to have ewes lambing. When ewes were lambing they should be attended to regularly, and the marking and tailing should be done during the first favourable weather. If grass was scarce it would be found beneficial to feed the ewes and lambs on a little hay or chaff. As shearing time approached, the flock should be culled, and all weedy or badly woolled sheep should be rejected. It was folly to breed inferior sheep, as they would eat as much as good ones. Salt was not used as much as it should be. Young sheep especially derived benefit from salt. Overstocking was a bad complaint, and it was very desirable to have quiet and contented sheep, as they did much better than wild ones. Sheep should be frequently shifted, and regularly dipped, and a supply of water should be always available. Wells were preferable to waterholes. Although the flocks in the south-east had improved of recent years, much more could be done.

Mr. A. J. Wedd agreed with a good deal of what Mr. Shinckel said. He thought it was very necessary to cull the flock regularly. Merino sheep were naturally wild, and it was best to keep them in paddocks larger than those in which crossbreds were kept. Mr. Stuckey asked how long rams should be kept with the ewes. In the old days they used to keep the rams with the ewes for about eight weeks, and he thought that was about right. Mr. Shinckel said it depended on the number of ewes. If there were only a few ewes, he thought four or five weeks would be long enough, but if there were, say, 80 ewes per ram he thought the rams should be left in about eight or ten weeks.

FORWARD MOVEMENT IN FARMING.

Mr. J. Davidson, of Millicent, read a lengthy paper on this subject. The day was gone when any one could make farming a success; the main essentials to prosperity of the farmer under ordinary conditions were the adoption of up-to-date methods of work, intense cultivation, the judicious use of fertilisers, and a frequent application of brain power. An eminent artist was asked by one of his students what he mixed his paints with, and the great master pointedly answered—"With brains, sir." Brains played an important part in successful farming. The farmer who had studied the nature of his soil and discriminately used fertilisers has astonished himself and his neighbours by increasing the yield of grain and root crops 20, 30, and 50 per cent. The forward movement in agriculture was being manifested in every branch of the industry. To be thoroughly progressive, both as regards stockbreeding, and cropraising, every farmer should be an experimentalist. Portions of his land should be set apart for trying the qualities of fertilisers and effect on various kinds of crops, ascertainng the most suitable fodders, &c., for his particular locality and nature of soil, which would prove a most valuable source of gaining exact knowledge for himself. Nothing could possibly take the place of such experiments. In the south-east the necessity for such work was very marked. Their land was eminently adapted for a varied order of agriculture, and compares favourably with the best farming land in New Zealand, where farming is carried out in a system of rotation of crops and deep cultivation. The average farmer of New Zealand works upon the principle of cropping a number of his paddocks from three to four years, and then laying them down with English grasses and pastures for a similar period. A farmer has from five to 10 acres of drilled turnips of different varieties, and perhaps 30 to 40 acres sown broadcast. The latter are fed off with sheep, while those drilled are used for dairy and store cattle. Sheep fed on the turnip fields are quickly topped up for the market. The effect of the sheep feeding the turnips off the land is equivalent to a good dressing of manure, as the succeeding cereal crop is always a heavy one, resulting in many instances in 60 to 80 bushels per acre of oats. The land for the turnips and other root crops is carefully prepared by being twice ploughed and scarified; the farmyard manure, as far as it will go, is incorporated in the working. A dressing of from two or three cwt. of bonedust or super is usually applied. The land is then opened in drills by means of a moulder plough, and the seed sown on the crown of the ridges with a double drill machine, provided with two small rollers. When the plants have become strong, whether turnips or mangolds, they are thinned out to eight inches apart with the hoe, so as to give the bulbs room to fully develop. It is safe to say that the produce of a given area will be 50 per cent. less if the plants are not thinned. The farmer who is going to make a success of his work, must keep abreast in the forward movement in agricultural practices. His house should be supplied with the best literature on the subject, and his family should be encouraged to take an intelligent interest in such literature. The literature of farming was within the reach of all, and from some of the better publications, the farmer can learn what successful farmers in other parts are doing In this connection he could not speak too highly of their own Journal of Agriculture, which should be read by every farmer in South Australia. Containing as it did, the results of local experimental work, and practices, and the advice of authorities who had studied local conditions it was of more value to them than any similar publication could be.

THE FARM OF THE FUTURE.

Mr. R. Campbell, of Millicent Branch, read a paper entitled—"The Farm of the Future." Of late years much had been done to burst up the big estates, and intense culture had been applied to many lands that were once only sheepwalks. But were present conditions the best that could be made? Wheatgrowing was a precarious business, and it was questionable if the wheatgrower would be able to hold his own against other wheat producing countries with cheaper labour, labour-saving machinery, and cheap land. He thought present conditions led to a great waste of energy, and the tillers of the soil laboured under great disadvantages. The holdings were not large enough to follow one line alone, and the farmer was at a disadvantage in all directions. He was exploited by the shipper, the labourer, the woolbuyer, the milk factory, &c., simply because the quantity of each commodity he produced was so small; and he suffered other losses, because the dealer, the wheatbuyer, the storekeeper, and others made compacts and combines against him for their own profit. The farm of the future, to compete against advanced and up-to-date conditions, must be of a much greater area, and all its industries must be worked departmentally under one management. Whether the farm of the future would be a joint stock concern or a co-operatively owned and worked business, or be carried on by the State, was subject for argument. He preferred State management. Such concerns—for there would be many—would provide profitable employment for the young men who were growing up, and would keep them in the country, and bring in revenue from a source and of a kind which made up a stable community.

In the discussion that ensued, most of the speakers condemned Mr. Campbell's "farm of the future." It was contended that farming on communistic principles was out of the question, and wherever tried had proved a failure. It was recognised that by co-operation, the producers could greatly benefit themselves, but this was quite different from Mr. Campbell's idea of State-managed farms, which would simply check independence of action and thought, and withdraw all incentive to progress.

CULTIVATION OF NATIVE GRASSES.

Dr. Ockley initiated a discussion on the improvement of their indigenous grasses. There were many of the native grasses that could be cultivated with profit, and on the lighter lands would pay as well, if not better, than ryegrass or cocksfoot. Then again the manuring of the natural pastures should receive attention. At Koorine, Mr. George Riddoch, had given them an object lesson in the benefit derived from clearing and burning the rubbish and distributing the ashes over the grass. Members agreed that much could be done in the improvement of the natural pastures, and that many of the native grasses were worth cultivating.

THE AGRICULTURAL EXPERTS.

Dr. Ockley on behalf of the Penola Branch initiated a discussion on "The Benefits Derived by this Portion of the South-East from the Agricultural Experts." Dr. Ockley's remarks practically resolved into a complaint that Penola had been neglected by the department. Nearly all the speakers, however, defended the department, and it was stated that the south-east as a whole had benefited considerably from the work of the officers of the department, and if Penola had been neglected, it must be due to the fault of the residents themselves. Professor Perkins pointed out that it was impossible for the officers to be continuously travelling, as they had responsible duties at headquarters to carry out. Still they made a point of accepting invitations from the branches of the Bureau, whenever possible, and he believed he was correct in saying that officers of the department had been at Penola on a good many occasions.

DAIRYING HERDS AND DAIRYING.

Mr. G. S. Thomson (Dairy Instructor), delivered an address on matters connected with the dairying interest. Mount Gambier was the finest dairying district in South Australia, and it was the duty of farmers to make the best of what was given them. Much had been done, but there was great room for extension. Instruction in the dairying practices was necessary, and Mount Gambier was the best centre in the south-east for the purpose. They wanted good practical men hand in hand with theoretical instruction. They looked to the practical man for assistance, and his experience was that his scientific work had been to confirm the farmer's discoveries. He referred to the rivalry which sometimes existed between factories, and expressed regret that this should exist, as it was much against the best interests of the industry. In their anxiety to get a supplier he had known a factory to take sour or inferior milk which another factory had refused. Heavy loss and injury to the industry followed this suicidal policy. The great success of the Danish system was due to co-operation. He was sorry this did not prevail more in Australia. In Mount Gambier they had a big supply of milk, but unfortunately they had not the quality; they had not the percentage of fat. That took him to breeding. They were told to breed for quality and feed for quantity. In the south-east the cattle—Shorthorn and Herefords—belonged more to the beef producing strain. Cross these and they had an animal perhaps giving a lot of milk, but poor in butter fat. There were five points to be regarded by the breeder and raiser of dairy cattle. They were as follows:—(1) They wanted a knowledge of the pedigree of the sire; (2) they wanted to know the attainments of the cows to be crossed, whether for beef or milk; (3) the breeding and rearing of the calves; (4) consideration of the feeding of the matured stock to maintain the body and milk; (5) the period of crossing, with attention to season, feed, and price of produce. The sire was more than the half of the herd. Milking qualities were transmitted as readily through the bull as through the heifers, and he was all the more important owing to the greater number of his offspring. One dairy expert had found that by using only sires from proved dairy herds, and by weeding out the worst milkers, in 15 years he had been able to considerably increase the total milk per cow. One year his cows gave 651 gallons each, and after 10 years' care they had averaged 861 gallons each. Another farmer with 18 cows got an average of 547 gallons per cow for 18 cows one year. The next year he got an average of 720 gallons, and the third year 805 gallons per cow. That was the result of careful breeding and feeding. A cow would give more and richer milk if she was given a change of pasture at intervals. The result of being left too long on the same herbage was that the animals might dry off earlier than otherwise. A point of great importance was when to breed from the heifer. Invariably the heifer in South Australia dropped her first calf too early, and the result was she never developed. It was a duty to feed cattle up to the demands of each one and use discretion The underfed animal was very often a victim to tuberculosis. Their cows invariably calved at a period of the year when there was abundance of feed, and the result was that there was a taint in the milk at the commencement of the export season. At that time of the year butter was low in price, but if cows came in at the time of year when butter was higher there would be better butter and more profit to the dairy farmer. The feed grown in the flush of the season could be saved for later use. They should feed to get a good flavour. Silage, rape, or cabbages, when given in large quantities, affected the flavour of the milk. When feeding with chopped straw or hay, with bran or copra cake, it was better to damp it the night before it was fed to the cows. Cows got much more nutriment out of bran and such foods when fed with something else. Milking was an important part of the work; it must be done thoroughly. If they left the rich strippings they did not get them next time. In America they were going in for what was called the manipulation process of milking. That was they stripped the cows thoroughly, and then waited a few minutes and commenced again, and the result was they got more milk, more butter, more profit.

A long discussion followed, and Mr. Thomson was asked a number of questions. He stated that for the south-east, he would recommend the Jersey-Shorthorn cross, as they would get a good quantity of milk of better quality than the Shorthorn. The Ayrshire-Jersey cross was too small for this district. A heifer should not be allowed to calve until three years old, and she should not be kept in milk too long. A number of those present agreed that the Jersey-Shorthorn cross was most profitable. Mr. Ruwoldt said his experience was that it paid best to keep heifers in as long as they will give milk. Professor Towar expressed surprise at the Jersey-Shorthorn cross being advocated, as the one was a strong dairy breed and the other a strong beef breed. In any case, when they found a certain cross or strain suited their local conditions they should stick closely to it. Mr. Thomson had given them a description of a good dairy cow, but they wanted something more practical; the real test was the milk pail and the Babcock tester.

TREE GROWING ON POOR LANDS.

Mr. A. J. Wedd opened a discussion on the reclamation of their inferior lands by the planting upon them of wattles and timber trees. He believed in wattle planting on waste lands. The seed was easily got, and was cheap, and land that was now practically worthless—that would not keep more than a sheep to 10 acres—would grow them splendidly. It need not be cleared or ploughed for sowing them. A man could put in two to three acres a day with a light dibber. The feather-leaved wattle grew well in some places and the broad-leaved in others. In 10 years the trees would strip five or six tons per acre of bark, which was now worth £5 to £6 per ton on the ground. Thus such land would return £2 an acre per annum for the 10 years, and allow 10/ an acre for expenses. Mr. Pick, who stripped 100 acres of wattles last year and got five tons to the acre, was putting in 160 acres this season. Timber was now very scarce at the Mount, and on some of their stringybark country, if it were fenced off from stock and protected from fires, thousands upon thousands of young saplings would spring up that in 18 or 20 years would be valuable timber trees. Other trees, such as redgum and walnut, or even pines, could be sown on such lands, and he was convinced that such work would be a profitable commercial transaction to the owner.

NEXT CONFERENCE.

A motion by Mr. R. Campbell in favour of dividing the district for the purpose of holding two Conferences annually, was defeated, and it was decided to hold the next Conference at Bordertown.

The usual votes of thanks closed the Conference.

SOUTHERN BRANCHES.

The tenth Annual Conference of the Southern Branches of the Bureau was held at Strathalbyn on Wednesday, April 1. The Hon. R. Butler, M.P. (Minister of Agriculture), Professor Perkins, and Professor Towar represented the Department of Agriculture. The following branches of the Agricultural Bureau were represented:—Finniss, Messrs. Chibnall, T. and S. Collett, Heath, Langrehr, and Henley; Port Elliot, Messrs. McLeod, Hargreaves, Brown, and Welch; Hartley, Mr. Brook; Meadows, Mr. Stone; Strathalbyn, Messrs. M., W. M., and A. Rankine, Tucker, Meikle, Mules, Butler, Cockburn, Sissons, Watt, McAnaney, Cheriton, and Reed; Port Pirie, Mr. Welch; Woodside, Mr. Caldwell.

Mr. Caldwell (the Chairman of the Council of Agriculture) presided, and spoke briefly in opening the proceedings.

The Hon. R. Butler gave an interesting address dealing with the work of the Bureau and the Department of Agriculture, and with the progress made of late years in agricultural pursuits. He spoke hopefully of the prospects of the South Australian farmer, and particularly mentioned the encouraging development of the lamb export trade. The question of treeplanting had received considerable attention of late years, and the Government was fully alive to the necessity for more fully developing their timber production. Recommendations from the Conservator of Forests to this end were receiving favourable attention.

BREEDING AND FEEDING OF STOCK.

Mr. H. Welch, of Port Elliot Branch, read a paper on this subject. He was quite convinced that insufficient attention was paid to the breeding and feeding of stock. In travelling round the country one was continually struck by the difference between the stock of the careless breeder and grazier, and the stock of those who take a pride and interest in their live stock. Some beasts will attract attention on account of their superior qualities, and in almost every case it will be found that there is good breeding behind them. Breed will tell under all conditions. Then why is it there are so many mongrels about their farms? Is it because they begrudged a few shillings extra for the services of a good animal, or was it too much trouble to drive or cart breeding stock to where a good male of the breed is stationed? Sometimes one, and sometimes the other; yet there was no denying the fact that the better bred animals are more generally profitable, whether it be stock for the butcher, the dairy, or poultry. He condemned the indiscriminate use of Jersey bulls in the dairy herds as certain to cause deterioration, though the Jersey crossed with a robust, large-framed cow will give a very useful animal. His experience as a grazier was that it was necessary to keep some cattle with the sheep, otherwise there was a lot of feed wasted. If the paddock is not overstocked the latter will leave a lot of rank growth, especially on the camps; this the cattle will eat. In buying cattle for feeding he had frequently seen the value of purebred stock demonstrated in the paddocks; he had known a Hereford cow rear a fat calf and be herself fit for killing at the end of the summer in a second-rate sheep paddock where mongrel cows failed to even keep themselves in decent condition Then, any one who has dealt in pigs to any extent knows that he must have good breed in the animals. Then with sheep, they aimed nowadays at wool and meat, and how did they get it? They put well-bred, robust, fair-woolled Shropshire rams to well-woolled merino ewes. The crossbred ewes can be again bred to Shropshire rams. Beyond the second cross it was not advisable to go, more especially as under ordinary conditions the best lambs were sold as fats. Then as regards feeding. It was very poor policy to stint or starve stock of any description; keep them growing from the start. Most of them had at one time or another bought horses in poor condition, and they had doubtless noticed what a lot of feeding it took to get them into good condition compared with the amount required to keep up that condition afterwards. So it was with other stock. Stock required regular feeding, warmth, change of diet, and a plentiful supply of pure water. The water should be where the stock can get at it when they require it. Sheep should not be expected to travel a mile or two in the hills for water; if they do they will not go to water as often as they should. Divide the grazing land into small paddocks so that the grass can be spelled occasionally, especially when young. Do not graze sheep and cattle together all the summer; while one paddock is being spelled some cattle might be put on it, as they do not graze so close as sheep.

BREEDING LAMBS FOR EXPORT.

Mr. M. Rankine (Chairman of Strathalbyn Branch) read a paper on this subject. Although not now actively engaged in the business, he had had 20 years' experience in the breeding of fat lambs. He did not favour the cross usually adopted, viz., merino ewe with Shropshire or South Down rams. What he found most profitable was the Lincoln-merino ewe crossed with one of the breeds mentioned. The ewes were larger, quieter, and better mothers than the pure merino, and when too old for breeding were good butchers' sheep. The merino is small in carcase, heavily woolled, of a roaming disposition, and not inclined to put on fat when young. He had no trouble with crossbred sheep breaking bounds, as he made it a practice not to overstock. True their wool was not of equal value to the merino, yet by care and attention it can be greatly improved. As a matter of fact, however, they could not get both fat and wool of the finest class on the same animal when young, and for lamb-breeders the sheep that put on fat instead of wool was most profitable. For the London market he had a strong preference for the use of Down rams, as the progeny matured earlier than the Shropshire cross. The Dorset Horn had come to South Australia of recent years, and while he could not speak from personal experience, the crossbred lambs he had seen at the Roseworthy College led him to believe that this breed might prove the best of all for the lambbreeders, as the lambs were fit for market at 10 weeks to 12 weeks' old. Another point he would refer to, and that was small paddocks. He considered that it was best to keep the flocks in small paddocks, and not to shift them from one paddock to another. The frequent shifting seems to unsettle them, and in a large paddock the ewes are always on the ramble, dragging the lambs about with them, and fouling the feed. He had found that with crossbred ewes the more Down blood in them the better mothers they were.

FEEDING OF STOCK.

Professor Towar gave an address dealing with various subjects of practical interest to the farmer. He particularly referred to the necessity for greater attention being paid to the feeding of stock. Generally it was necessary to supplement the natural pastures with more concentrated foods. The provision of feed during the dry seasons must receive attention, and in this connection the value of the silo could not be overestimated. He could not understand why it was that the farmers generally had not made more use of ensilage. The necessity for well-balanced rations for stock, and the freer use of salt, were also mentioned. Methods of cultivation to conserve moisture, and to make the plant food in the soil available, were also dealt with. Considerable discussion ensued on the subject of ensilage.

FRUIT GROWING.

Mr. W. E. Hargreaves, of Port Elliot Branch, read a paper on "The Fruit Industry—Past and Present." The fruit industry in South Australia had made rapid strides of late years, and although our people were beginning to recognise more the value of fruit as an article of food there was no question but that outside markets would have to be developed to dispose of the product. They could hardly hope for many years to come to find a profitable outlet for all the soft fruit they were growing, but in other lines the prospects were much better. The fruitgrowers of the present day were mastering the main principle of cultivation, and were producing better fruit than formerly: still there were many difficulties to contend with, especially in the matter of the treatment of codlin moth, and other pests. The beginners of to-day had the experience of the older growers to guide them, and are consequently in a much better position to secure success. There were excuses for failures of the past, as the experience had to be gained by the grower himself, and often at considerable cost. In fruitgrowing mistakes were usually costly, as it meant the loss of several years' work if the wrong varieties of trees are planted, or the wrong position selected. It was essential, therefore, to start cautiously; the advice of an experienced grower should be sought if possible, and the planter must make up his mind that he will have to pay great attention to the cultivation of his land and the training of his trees to secure success. Careful thought must be given to the selection of varieties to plant. While he was convinced that there was a profitable future before our export trade, there was no question that already too much fruit of an inferior kind was grown. Not only did the grower of inferior fruit suffer, but the market for good-quality fruit was also spoilt. When it is remembered that with nearly all trees that are healthy it is only a matter of two or three years to rework them, and get them into bearing again, the more foolish and inexcusable does the production of inferior fruit seem. As far as their apples and pears were concerned he believed their export trade was only in its infancy. Now that the shipping companies were able to carry the fruit to Europe in uniformly good condition, the only requisite to a very large trade was cheaper freights. Taking everything into consideration, he was convinced that if the grower could get 2/ per bushel in the orchard it will pay to grow apples. There were, of course, drawbacks to the beginner, the principal one being that it is frequently 10 years before any considerable return can be expected. This, however, made it all the more necessary for people to count the cost thoroughly before they embark in the fruit industry. The selection of the site for the orchard was of the first importance; it was simply throwing money and time away to plant in unsuitable conditions. Their principal export fruits were apples and pears; these were not delicate plants, but it was courting failure to plant them on dry, sandy, or wet peaty soils. As a general rule they will do best where there is a good clay subsoil. The surface soil was practically a secondary consideration, so long as it is capable of fulfilling the mechanical functions of admitting air, warmth, and moisture. A deep rich surface soil was less suitable for apples and pears than one with a good clay subsoil at moderate depth. The richer the clay the better, and he had no doubt of the superiority of such land over all other kinds for apples and pears. Before planting the land must be thoroughly prepared; if virgin ground, it is better to clear and break it up some time beforehand, to give the soil a chance to mellow and sweeten. When the trees are planted, constant and careful attention are necessary. The trees must be properly trained, and the ground cultivated. The whole surface of the orchard should be cultivated three or four times each year. Drainage was an important question; a gentle slope with good natural drainage was best. Water-logged soil was fatal to healthy growth. Many growers will ridicule the idea of underdrainage being necessary, because they say the ground already gets dry quite soon enough. The effect of drainage, however, is not sufficiently appreciated by them; as a matter of fact good drainage only removes the surplus water, and actually prevents rapid drying out in the summer. The conservation of moisture during the summer months was one of the most important matters that the orchardist has to deal with in this State, and in dealing with this the value of drainage cannot be overestimated.

STINKWORT.

Mr. Cheriton read an extract from one of the intercolonial papers, in which the writer warned Victorian and New South Wales farmers against purchasing seed wheat from South Australia on account of the danger of introducing stinkwort. It was stated that the weed had ruined large areas of country in South Australia, and that it would be introduced into other parts in seed wheat.

A resolution was carried that the Chairman write to the Editor of the paper in question pointing out (1) that as the wheat was reaped months before stinkwort came into flower there was no danger of the seed wheat being contaminated; (2) and that while stinkwort grew freely over large areas of country it was not a fact that any farming areas had been ruined by it.

SHEEP.

Mr. G. Meickle, of Strathalbyn Branch, read a paper on the most profitable sheep. He said it had been demonstrated that in the hills district they could grow merino wool equal to almost any other part of Australia, and the question naturally arose—"What class of wool can we most profitably grow?" From time to time they heard it stated that the South Australian merino was unsurpassed, and many records of championship prizes are quoted in support of this. He thought, however, if they looked into this matter they would find that these prizes have been all, or nearly all, won at the Adelaide Shows, where there is no outside competition. If they studied the awards at the most important sheep shows in Australia, viz., Melbourne and Sydney, they would, however, find that the majority of honours go to the Tasmanian merino, or to flocks founded on and bred to that type. Of late years the Vermont had been scoring heavily, but this type of merino was comparatively new to Australia, and it remained to be proved whether it had come to stay in its pure type. It was impossible to pass over lightly sheep with such long-sustained records as possessed by the Tasmanian merino. He was convinced that this breed of sheep must come to the front, as it was eminently fitted to the requirements and climatic conditions of the district. Some breeders had already proved this and high prices had been paid for rams. He had particulars of the results of the past season from a small flock bred from Tasmanian rams from the famous Gibson stud. Eight hundred and fifty sheep and 246 lambs were shorn for 31 bales of wool; the bales averaged 3 cwt. 2 qr. 5 lb. each, or an average of 10 lb. 14 oz. from the flock, lambs included. Some of the ewes cut wonderful fleeces: one old ewe, which had reared 11 lambs, cut 16½ lb., and a four tooth 20¼ lb. The quality of the wool is excellent. The sheep are very handsome, short on the legs, with a heavy front; the wool has splendid tip. He had noticed that Victorian wool grown on similar country realized 1d. to 2d. per lb. more than wool from the South Australian hills district. An Adelaide salesman told him that this was due to the fact that Victorian wools were better yielding wools than their own. One had only to compare typical Tasmanian and South Australian merino wools to see where the difference was, and how it was the buyer could afford to pay more per lb. for the former. The fact that the Victorian wools referred to brought higher prices was due to the flocks being mainly founded on the Tasmanian sheep. The South Australian merino produced a strong wool of great length of staple, and also, unfortunately, too much length of tip, whereas the other was finer, close, more dense, and with far less tip. It was largely owing to the quantity of tip on their wools that they were worth so much less per lb. Many objections are urged against the Tasmanian sheep, but they have all been answered satisfactorily in the other States, and when it comes to practical working there is nothing serious in any of them. He hoped the hills branches of the Bureau would discuss this matter thoroughly, as he believed there was considerable room for improvement in the type of sheep kept.

Discussion on various matters of general interest, and a vote of thanks to the Chairman, Secretary (Mr. J. Chelton), and to the speakers concluded the Conference.

FEEDING WORKING HORSES.

In a recent interview with one of the daily papers, Mr. John Hill, who has the oversight of between 400 and 500 horses used in Messrs. J. Hill & Company's mail service, made the following remarks in reference to the feeding and watering of horses:—

"Horses doing ordinary work should be given on an average about 25 lb. of food a day, including chaff, bran, pollard, oats, and molasses all mixed together. Slow-worked horses should be given more bran than fast- worked ones. For slow work they do not require oats to keep them in condition. For every 30 lb. of feed the proportion of ingredients should be 3 lb. of bran and pollard, 2 lb. of oats, ½ lb. of molasses, and the rest good chaff. The great thing is to regulate the feed. It is not desirable to put half a ton of the mixture in front of the horse at once. Regular feeding will keep a horse in good fettle, provided it is not overdriven. A horse should be fed four times a day, giving six or seven pounds of the mixture referred to at each meal. It does not hurt the animals to allow them free access to hay, for that has to be "chaffed" by them, and it takes them a long time to overfeed themselves. The reason hay is chaffed up is to give working horses a chance to get a meal in a limited time. We give our mail horses not less than 25 lb. of feed daily, and that is ample, but heavy draughts need more; say, about 30 lb. Our mail horses on the principal routes are worked on an average for nine hours a week, and we keep three teams for each stage not under 12 miles for the big coaches. Some people believe that horses should not be watered fresh from a journey, and I met a man the other day who was surprised that we gave our horses a drink as soon as they came in. No harm can result, if the water is of the normal temperature, but cold well-water might give them colic if they drink it when they are heated. Horses are more likely to suffer if they are allowed to cool down before drinking."

Referring to the value of molasses for stock, Mr. S. S. Ralli, of Werocata, writing early in January to "Bruni," of The Australasian, says:—"I have used molasses for the last 12 years for feeding horses and cattle, and I think it a very valuable food. Now that bran is at such a high price, I do not give my draught horses any bran at all, but mix molasses with their feed. At the present price of bran it works out at about 1d. per lb., and molasses at ½d. per lb. One pound of molasses will go as far as 3 lb. of bran as a stock feeder. It keeps the horses' bowels in nice order and gives them good coats. At the present time, owing to my country being very bare, I am feeding the bulk of my Shropshire lambs. They are getting cocky chaff and molasses steamed, and I think they will do very well. I am not an authority on dairy cows, but I am told that molasses is too fattening to give them in any quantity, and I think it is wrong to give it largely to either bulls or stallions. A little will not hurt either; in fact, will be beneficial."

MONTHLY RAINFALL.

The following table shows the rainfall for the month of April, 1903:—

Adelaide	2·78
Hawker	2·59
Cradock	1·55
Wilson	1·88
Gordon	1·29
Quorn	1·97
Port Augusta	1·21
Port Germein	2·01
Port Pirie	2·01
Crystal Brook	2·71
Port Broughton	1·91
Bute	1·99
Hammond	2·21
Bruce	1·81
Wilmington	3·27
Melrose	3·61
Booleroo Centre	3·36
Wirrabara	3·59
Appila	2·67
Laura	4·11
Caltowie	2·87
Jamestown	3·31
Gladstone	3·05
Georgetown	4·03
Narridy	2·86
Redhill	2·89
Koolunga	2·22
Carrieton	1·95
Eurelia	1·68
Johnsburg	1·72
Orroroo	2·43
Black Rock	3·02
Petersburg	2·32
Yongala	2·50
Terowie	2·63
Yarcowie	2·98
Hallett	3·49
Mt. Bryan	3·03
Burra	2·51
Snowtown	1·95
Brinkworth	1·81
Blyth	2·39
Clare	2·87
Mintaro Central	3·11
Watervale	3·78
Auburn	3·48
Manoora	3·11
Hoyleton	2·83
Balaklava	2·67
Port Wakefield	1·93
Saddleworth	2·98
Marrabel	3·46
Riverton	3·32
Tarlee	3·51
Stockport	2·94
Hamley Bridge	2·68
Kapunda	3·87
Freeling	3·46
Stockwell	4·50
Nuriootpa	4·40
Angaston	4·33
Tanunda	4·15
Lyndoch	3·67
Mallala	3·00
Roseworthy	3·22
Gawler	3·25
Smithfield	1·84
Two Wells	2·77
Virginia	2·35
Salisbury	2·82
Tea Tree Gully	4·50
Magill	3·39
Mitcham	3·28
Crafers	6·90
Clarendon	6·79
Morphett Vale	2·72
Noarlunga	2·82
Willunga	3·25
Aldinga	2·62
Normanville	2·22
Yankalilla	2·12
Eudunda	3·04
Truro	2·93
Mount Pleasant	3·51
Blumberg	3·80
Gumeracha	4·41
Lobethal	4·96
Woodside	4·38
Hahndorf	6·07
Nairne	3·81
Mount Barker	4·77
Echunga	4·23
Macclesfield	4·19
Meadows	3·61
Strathalbyn	2·51
Callington	2·65
Langhorne's Bridge	2·00
Milang	2·04
Wallaroo	2·07
Kadina	2·34
Moonta	2·35
Green's Plains	1·86
Maitland	2·19
Ardrossan	1·61
Port Victoria	1·67
Curramulka	2·16
Minlaton	1·39
Stansbury	1·55
Warooka	1·23
Yorketown	1·32
Edithburg	1·77
Fowler's Bay	3·74
Streaky Bay	1·50
Port Elliston	1·56
Port Lincoln	2·32
Cowell	1·14
Queenscliffe	1·66
Port Elliot	2·68
Goolwa	2·28
Meningie	2·39
Kingston	2·96
Robe	2·23
Beachport	2·09
Coonalpyn	1·86
Bordertown	2·66
Frances	2·45
Naracoorte	2·40
Lucindale	3·55
Penola	2·61
Millicent	2·55
Mount Gambier	3·31
Wellington	2·70
Murray Bridge	2·13
Mannum	1·84
Morgan	1·59
Overland Corner	1·10
Renmark	1·01

AGRICULTURAL BUREAU REPORTS.

Woodside, March 16.

Present—Messrs. Caldwell (chair), Lorimer, Rolbusch, Fowler, Keddie, Lowe, Lauterbach, Schroeder, Johnston, Kleinschmidt, and Hughes (Hon. Sec.).

Closer Settlement.—Mr. C. W. Fowler read a paper on this subject. He was greatly impressed with the capability of this and the surrounding districts to carry a much larger population than at present. In the township of Lobethal there was a splendid illustration of what can be done on small holdings. The town proper consists of two sections of land with a creek running through them. On each bank there is a fair area of garden land suitable for intense cultivation. The land was cut up into one chain or two chain strips right across the section, the allotments being from three acres to five acres in area, and each is large enough to enable the occupier to keep a cow or two, a few pigs, poultry, &c., and with intense cultivation to make a little more than a living. Some of the residents hold two or more allotments, and nearly all are quite free of mortgage, and in practically independent circumstances. The residents are mostly industrious Germans, and this undoubtedly largely explains the success achieved. If other townships in the hills had been laid out on a similar plan to Lobethal, instead of in quarter-acre, or even less, blocks, the working classes would be largely independent of outside work. The cutting up of the old reserves, and the purchase of land for subdivision by the Government was a step in the right direction, but most of the best land was private property, held largely for grazing. In the Onkaparinga district there were thousands of acres that would support a family on 50 acres, and a considerable area of land 10 acres of which would keep a family. In the neighbouring districts conditions were similar, and they could find many persons doing well on less than 10 acres of good land. On the 50-acre blocks they could not, of course, grow wheat or hay for sale, but by conserving water and irrigating small areas a large variety of products can be grown. On many parts vines will do well, and there appeared a good prospect, not only for the wine industry, but also for dried fruits. Then there was the apple industry, which, conducted on proper lines, would prove profitable. The export trade was growing rapidly, and there was room for considerable expansion. On the small holdings dairying, under a system of intense cultivation, could be largely developed. Pigs, poultry, bees, &c., would all assist the small landholder in making a living. Probably the most important essential to success with these small holdings was that the family must be sober and industrious. Considerable discussion ensued, members generally being of opinion that Mr. Fowler was rather too sanguine about what could be done on 10 acres of land.

Minlaton, March 21.

Present — Messrs. A. McKenzie (chair), Teichelmann, Correll, Mayer, Twartz, Brown, Martin, Bennett, and J. McKenzie (Hon. Sec.).

Spekboom.—Mr. Correll stated that he had some plants of this growing well, and thought it would prove valuable for stock. It was decided to secure a number of plants for trial.

Analyses of Fertilisers.—Member wished to know results of analyses of samples of Fertilisers taken by the Inspector of Fertilisers. [See page 542 of the April issue, and 605 of this issue of The Journal of Agriculture.—Ed.]

Sticky Supers.—Mr. Correll found that by mixing about 12 lb. of Thomas phosphate to a bag of damp superphosphate the manure ran freely. Other members mixed a little air-slaked lime with the super. and found it effective.

Lucerne.—Some members reported success with lucerne, and advocated growing it on the farm on account of its value for cows, pigs, and poultry. It was stated that by drilling in a little lucerne seed with the wheat in the small paddocks near the homestead they had doubled the carrying capacity of the farm.

Narridy, March 21.

Present—Messrs. Turner (chair), W. R. and E. Smart, Freebairn, Liddle, Dixon, and Dunsford (Hon. Sec.).

Management of Horses.—Mr. Smallacombe forwarded paper on "Care and Management of Farm Horses." First be careful not to overdrive the horses; it was better to work longer hours than to attempt to make the horses travel fast to get the work done in a shorter period. With the weight he has to draw, it was out of the question to expect a horse to travel fast over heavy ground. Always use backbands; they make the draft more even, keep the chains from chafing, and also prevent the collar from working on the points of the shoulders. Working without backbands causes sore shoulders, roached back, hollow withers, and dragging steps. Horses should be well groomed at least once a day. While the horses are at heavy work feed on chaff, with a little corn at dinnertime. He preferred boiled wheat or barley to crushed grain, as although it caused the animals to sweat more it was not so heating as crushed wheat or barley. Long hay should be fed to horses which are idle and on wet days. It pays to use as much as possible of the hay chaffed as it saves the horses teeth, and there is not so much waste as with long hay. He would allow a horse to drink as often as it liked except when very hot. Horses receiving brackish water keep their coats better, sweat less, and generally do better than those receiving rainwater. All horses should be turned out in the spring for a time, and allowed to get quite fat; this will be found of great help in keeping them in good health. Foals should be well fed, and kept fat; they will be less liable to disease, and make better horses than those that are stinted in food while young. Members were generally in accord with the writer of the paper.

Port Elliot, March 21.

Present—Messrs. McLeod (chair), Green, Nosworthy, Gray, Hutchinson, Parnell, W. E. and W. W. Hargreaves (Hon. Sec.), and H. Welch from Port Pirie Branch.

Codlin Moth.—Mr. Hutchinson reported very satisfactory results from spraying of apples with arsenical poison. The sprayed trees were carrying a fairly clean crop, but those untreated were badly affected. He thought that if all growers were compelled to spray their trees thoroughly for a few years they would almost eradicate the moth.

Lucerne.—In reply to question, members thought it would be a good plan to sow barley with lucerne, as the former would shelter the young lucerne from frost.

Homestead Meeting.—Members met at Mr. H. Green's residence, and, after conclusion of formal business, inspected the homestead surroundings. A novelty in the Turkish marrow growing on some poles, and with fruits up to 3 ft. in length, was inspected with interest. The fruit drying kiln was seen at work, and the quality of currants, raisins, &c., much admired.

Inkerman, March 10

Present— Messrs. Fraser (chair), Smart, Kennedy, C. H. and C. E. Daniel (Hon. Sec.).

Cropping Stubble Land.—Members generally agreed that it would pay to apply manure to stubble land that had been manured the previous season, and instances were cited of fair returns from crops on stubble put in with manure.

Best Cultivator.—Considerable discussion took place on this subject. The Chairman advocated the skim-plough, others thought the spring-tooth cultivator very effective if used early enough.

Hartley, March 13.

Present—Messrs. Klenke (chair), Wundersitz, Jaensch, Reimers, Sanders, Hassam, Kutzer, and Stein (Hon. Sec.).

Pickling Seed Wheat.—A long discussion took place on the best way to pickle seed wheat. Most of the members favoured using bluestone. Some pickled in a tub or cask, others sprinkled the solution over the seed and turned the heap.

Protecting Seeds from Birds.—Mr. Wundersitz said he had followed Mr. Molineux's advice to mix seed with red lead to prevent the birds taking it, but it did no good. Tar was far more effective.

Yorketown, March 14.

Present—Messrs. Lloyd (chair), Latty, Jung, Domaschenz, A. E. and C. Anderson, and Newbold (Hon. Sec.).

Working Salty Lands.—Mr. Domaschenz read a short paper on the utilization for cereal growing of the salt patches on their farms. On Yorke's Peninsula there was a lot of land that formerly produced good crops, but which now does not even grow grass. These were generally called "salt patches," but he thought there was little if any salt in some of them. He had tried different methods of treatment of this land with very good results. In 1901 he treated a four-acre patch, cultivating it five times, in each instance after rain. He did not plough as the ground was already too loose. In June, 1902, after rain he put wheat in with the drill, and secured a good sample of grain from the plot. Alongside was a similar piece of ground which was cultivated dry, and was sown while dry; from this he got no return whatever. The land is dark grey in colour and looks well. A long discussion ensued, the various methods adopted in treating similar soils being explained. Generally members had had but little success with this class of land.

Gawler River, March 13.

Present—Messrs. Parker (chair), Roediger, Spencer, Krieg, Winckel, Badcock, Hillier, and Bray (Hon. Sec.).

Feeding Horses.—Mr. Badcock initiated discussion on this subject. Crushed barley was too heating, causing softness; slightly boiled it was better, but involved too much labour. Crushed wheat was also too heating, and while maize kept the horses in good condition, they seemed sluggish. Crushed oats and hay chaff was a splendid feed. Whole oats was not so good, especially for old horses. Members generally favoured use of crushed oats. For working horses it was agreed that chaff was best cut short, especially if corn is fed with it. Mr. Roediger advocated adding loose salt to the food for horses and cattle.

Horses' Teeth.—Mr. Badcock stated that last season he had his horses teeth attended to by a veterinary, and found they afterwards improved rapidly in condition. He believed all horses over 10 years of age should have their teeth attended to by a competent man. The operation was best performed early in spring, as the grass was then tender; the operation made the teeth sore so that dry food was not suitable.

Renmark, March 19.

Present—Messrs. Rose (chair), Showell, Turner, Waters, Nuthall, and Cole (Hon. Sec.).

Alkali Soils.—Mr. Showell read paper by Prof. Hilyard, of California, on "The treatment of alkali soils," and considerable discussion ensued on the cultural treatment of such land as applied to Renmark soils.

Quorn, April 11.

Present—Messrs. Thompson (chair), Rowe, Patten, Toll, Smith, Cook, Walker, McColl, Brewster, and Noll (Hon. Sec.).

Poultry.—Mr. Walker read a paper on some essentials in the management of poultry. He placed the supply of cut bone first. For growing chicks it was especially important, and will build up healthy stock. The leg weakness in chickens, which they hear so much about, was, he believed, due to lack of bone and muscle forming food. Fowls were exceptionally fond of cut bone, and he found it best to give it between the usual meals. The coarse particles in the cut bone helped in digesting the food. Bonecutters could be purchased at a reasonable rate, and the bones from the table or fresh bones from the butcher cut up for the fowls. Green cut bone was cheaper and better than meat food. The greatest of care must be taken to avoid using bones from horses or cattle that have died from disease. If a bonecutter is not available, break up the bones on a flat stone. Lime was another important essential. Many poultry owners seemed to expect their fowls to lay eggs with proper shells without providing a supply of lime for them. Where eggs had to be sent long distances to market it was important that the shells should be strong. He made it a practice to provide a liberal supply of crushed limestone for his fowls. Sharp grit was essential to the proper digestion of the food given to fowls. Waterworn grit or gravel was not suitable for the purpose. He used to find a considerable amount of undigested food in the dung; but since supplying broken glass or crockery he had noticed a marked difference. The presence of undigested food in the dung was proof of their inability to assimilate the food given them, and that the owner was feeding to waste. Other essentials to success were pure water, warm roosting place in the cold weather, and cleanliness. Considerable discussion followed the paper.

Watervale, April 6.

Present—Messrs. Sobels (chair), Holder, Scovell, Ashton, Perrin, Hunter, Solly, Treloar, Smith, E. W. and O. H. Castine (Hon. Sec.).

Maize and Sorghum.—Mr. Hunter tabled splendid cobs of maize; also maize chaff. Members were of opinion that the chaffed maize would be splendid food for all classes of stock. Members wished to know simple and cheap way of stripping holcus and similar seeds from the stalks. [Where sorghum is grown in any quantity special machines are used. These consist of revolving drums studded with spikes about 2½ in. long. The heads are held on the drums until the seed is stripped. For small lots probably the most general method is to draw the heads through the comb of a stripper, and afterwards winnow it. Beating the heads is also practised.—Ed.]

Port Pirie, April 11.

Present—Messrs. Johns (chair), Hannan, Wright, Crispin, Lawrie, Morrish, Smith, Hector, and Wilson (Hon. Sec.).

Rabbits.—Considerable discussion took place on protection of crops in the district from rabbits. A Committee was appointed to wait on the local District Council to urge the necessity for erecting a rabbit-proof fence along the western slope of the Flinders Range to prevent the incursions of rabbits from the range.

Bluestone Tests.—The Chairman read extract giving simple methods for testing the purity of bluestone, and some discussion followed. He also reported on some experiments to test the effect of bluestone on the germinating power of wheat. As the wheat was badly cracked in stripping, not much was learned from the experiments; but it was generally admitted that the bluestone lessened the percentage of germination.

Colton, April 4.

Present—Messrs. Kleeman (chair), Whitebread, McCracken, Kenny, and Packer (Acting Hon. Sec.).

Manure Experiment.—Discussion took place on results of experiments with different manures for wheat crops carried out by Mr. W. J. Packer, under the supervision of the Department of Agriculture. Members considered the small returns due to the light rainfall during the growing season, and the hot winds during October. Members stated that the experiments in question had resulted in a considerable area of land in this district being manured with fertilisers.

Wilmington, April 6.

Present—Messrs. Slee (chair), A. and M. Bischof, McLeod, Broadbent, Schuppan, Lauterbach, Maslin, Noll, Sullivan, Hannagan, Bauer, and Payne (Hon. Sec.).

Deep v. Shallow Ploughing.—Mr. McLeod initiated a discussion on this subject. The prevailing opinion of the farmers present was that in dry seasons shallow ploughing was better than deep ploughing, but in wet seasons it would pay here to plough 6 in. or 7 in. deep. Mr. McLeod would not plough more than 3 or 4 in. before seeding, but would go deeper in fallowing. On a vote being taken shallow ploughing was favoured by a majority of six votes to two.

Increasing the Usefulness of the Bureau.—Mr. R. G. S. Payne read paper prepared for September Congress by Mr. W. L. Summers, and offered some remarks thereon. He was exceedingly pleased with the paper, and generally agreed with the writer. The question of membership was of vital importance; the young men—sons of farmers or the work hands—should be induced to join the Bureau. Visitors should also be encouraged as much as possible. Experiments on a fairly large scale should be undertaken in groups in various districts. He favoured charging for The Journal of Agriculture; the revenue, together with subsidy from the State, being devoted to experimental work. He considered the Journal a most valuable adjunct to their agricultural literature, and worthy of a prominent place in every library. It was resolved "that if Mr. Summers' suggestions were carried out the various branches of the Agricultural Bureau would become more useful."

Improvement of Dairy Herds.—The Shorthorn bull, Roan Duke, purchased by the branch two years ago at considerable cost, has thrived well, and developed into a splendid animal. Much good is expected to result from his presence in the district.

Nantawarra, April 8.

Present—Messrs. F. Nicholls (chair), R. Nicholls, Dixon, Belling, E. J. and A. J. Herbert, Sleep, and Spencer (Hon. Sec.).

Black Rust.—A lengthy discussion on black rust in wheat crops took place, and it was agreed that generally the disease was worst on light, loose land sown early and dry. Pickling was not a preventive.

Pickling for Bunt.—Methods of pickling were discussed. Mr. R. Nicholls was having a trough made a little longer and deeper than a bag of wheat, and he intended to dip the bag in the trough, leaving it until all bubbles had ceased to rise. Mr. Dixon wished to know how to keep water at proper temperature when pickling oats or barley. [Two coppers of water are required: one at a lower temperature than required for pickling. The seed is dipped first in the cooler water for a few minutes to take off the chill then plunged in the copper with water at a temperature of 130F. to 133F. for 15 minutes. The coppers must be kept over a slow fire, or a quantity of boiling water added as often as necessary to keep the water at the required temperature. See page 668 of March, 1902, Journal of Agriculture.—Ed.]

Johnsburg, April 11.

Present — Messrs. Potter (chair), Dunn, Masters, Luckroft, Hombsch, McRitchie, Johnson (Hon. Sec.), and two visitors.

Binder and Strippers.—Mr. F. W. Hombsch read a paper on this subject. He proposed to deal with this question so far as it concerned the northern areas. He did not for a moment believe that the stripper would be replaced by the binder. The difficulties experienced during the past few years in securing food for stock in the drought-stricken areas had directed attention to the question of conserving fodder in seasons of plenty. The farmers, however, could hardly be blamed for the shortage of feed, as it is scarcely possible for any of them to save as much food as would have carried them over the six dry years just experienced. Still, it would be possible for them to save in years of plenty sufficient straw or hay to carry them through the first year or two of the drought, and they would have been well repaid for their trouble and expense. The cost of harvesting a twelve-bushel crop with the binder was about 5/ per acre more than with the stripper, or on 100 acres £25. For this outlay the farmer would secure in addition to the grain 80 tons to 100 tons of good clean straw, which if properly thatched would retain its value for a considerable length of time, and be worth at least £1 per ton when needed. By using the binder they could start the harvest earlier, and it would be possible to cut, say 100 acres to 150 acres before commencing with the stripper. Then in rusty years they often would get a much better sample from the wheat harvested early than from that stripped; there was also less danger from loss by storms or fire. A good discussion ensued. During the drought the farmers had suffered severely owing to absence of feed, and it was agreed that if previously in good seasons the binder and header had been used to harvest portion of the crop there would not have been the same difficulty. Some members stated that the chaff from binder straw had a tendency to cause scouring, and required the addition of crushed wheat or other substantial feed. With straw gathered after the stripper and stacked, it was noticed that stock appeared to do better if allowed to help themselves from the stack. If fed in the stable it should be mixed with molasses. It was stated that a large quantity of very inferior chaff had been sold throughout the State, a considerable quantitity of straw being cut up with the hay, and it was suggested that legislative action should be taken to prevent this fraud being continued. It was resolved that "this Branch strongly condemns the practice of chaffing up straw with hay and selling it as hay chaff."

Booleroo Centre, April 7.

Present—Messrs. Nottle (chair), Stevens, Sargent, Clack, Brooks, Miller, Repper, McMartin (Hon. Sec.), and two visitors.

Profitable Farming.—Mr. Miller read a short paper on "Farming for profit." A farmer must learn by practical experience wherein he has failed to make the best of the means at his disposal. Energy and enterprise are splendid attributes, but industry and commonsense are more effective in overcoming the difficulties the farmer has to contend with. From grains of theory the farmer may secure a crop of knowledge. Practical proof of what is most beneficial can be gained by testing as far as possible new ideas. Science is, in the first place the property of the scientific man, but it diffuses knowledge to all seekers. In farming the best methods should be adopted to the fullest of their ability; profiting by experience to improve on previous practices. If the farmer is not of an experimental turn, he should not fail to watch and profit from the experiences of others who take up such work. No one was too old to learn something fresh. Members generally agreed with Mr. Miller; and regretted that he had not dealt more fully with the subject. The improvements in farming practices of late years was admitted, and it was claimed by Dr. Steven that the principal improvements effected in agricultural machinery were the outcome of the experience and ideas of practical farmers.

Saddleworth, April 18.

Present—Messrs. Frost (chair), Bee, Benger, Daley, Eckerman, Plant, Coleman (Hon. Sec.), and one visitor.

Fertilisers on Grass Land.—The secretary reported having received half a ton of grass manure from the Agricultural Department for trial, and that he had drilled it in pasture that had not been cultivated for over 20 years, a part, probably never having been broken up.

Weeds.—Samples identified by the Department of Agriculture were exhibited, and included Saffron, True Star, and Barnaby's, or Yellow Star thistles; the latter, sometimes termed "English Cockspur," was spreading very rapidly, it was a useless weed. A specimen of Toadflax (Linaria elatine) was collected from the railway reserve, and was reported to be spreading very much along the line.

Bleached and Unbleached Wheat.—Samples grown under exactly the same conditions, but reaped before and after the rain of December 16, were shown. A small quantity is being sent to the N.S.W. Department of Agriculture, by request, to be tested by mill and analysis to see what property is lost when ripe grain becomes bleached by rain.

Dairy Cows.—Mr. F. Plant, in a short paper, advised testing the cows' milk rather than depending upon shape and general appearance. No farmer should be without cows. Dairying was profitable in this locality, which was not recognised as a dairying district. Separating the milk and sending cream to Adelaide—a practice followed for years by some members—was a better plan than making butter. With a spring balance and Babcock tester to weigh and test the quality of the milk, the inferior cows could be detected and culled from the herd.

Cultivation of Red Land on the Gilbert.—A short practical paper by Mr. Daley introduced this subject. He thought the after cultivation of the fallow even more important than the ploughing. Scarify the fallow before the weeds get any headway. Fallow early, kill all rubbish, and work the land down fine before the hot winds come. If lumpy, roll, and again harrow to leave surface loose. A second scarifying was necessary to kill young stinkweed.

Clare, April 3.

Present—Messrs. Kelly (chair), Christison, Carter, Martin, A. P. and W. P. Birks (Hon. Sec.).

Our Wool Industry.—Mr. Carter read an interesting paper on this subject, describing the establishment and growth of the merino flocks of Australasia. He tabled the samples of merino wool, and described the various qualities and defects. He urged the necessity for greater attention being paid by farmers to the get up of the wool. Any one visiting the wool showrooms for the first time would be surprised at the number of carelessly got up lots. Appearance undoubtedly goes a long way, and it will pay farmers to attend to this matter. It was necessary to keep a clean shearing shed and the floor well swept. Have a good wool table to spread the fleece on, and be careful to shake out all second cuts; then go around the fleece and take off every piece of stained or clotted wool, then go around again and pull off all coarse and burry places, before folding up the fleece, after the manner of folding a blanket, and place them carefully into the bales in even rows, and neatly sew down. Never mix the classes of wool. If you have a mixed flock, and only have three bales it is better to put each class into a bale of its own, and brand what they are even if they are sold in one lot. Make the bales as even as possible, for should the broker open a bale for a sample, which is better than the average, you will most certainly suffer next year, while if he opens one of the worst you will fall in at once, so in any case the woolgrower must suffer if he does not send his wool to market honestly packed, classed, and branded plainly, and if he intends carrying on business his brand will soon be known, and his wool bought with confidence.

Mount Compass, April 10.

Present—Messrs. Jacobs (chair), Arthur, Gowling, Hutton, Jenkin, Slater, Sweetman, F. and H. McKinlay (Hon. Sec.), and three visitors.

Duties of Members.—The Chairman read a short paper on the duties of members of the Agricultural Bureau. He thought that, in spite of what had been published from time to time on this subject, there was room for considerable improvement, in the manner in which the members attended to their duties. The average attendance of members at Bureau meetings could not be regarded as satisfactory; as for the young men of 17 to 25, they were conspicuous by their absence. Why is it that outsiders take so little interest in the Bureau? Is it because the farms and gardens of the members show that they preach what they do not practise? The members of the Bureau were indirectly paid by the Government for their services; they received each month The Journal of Agriculture free, also stamps and stationery required to carry on the branch; the advice of the experts was always at their commands, and in other ways the Government endeavoured to assist them. In return it was their duty to attend the meetings regularly, and to place at the disposal of their fellow members such information concerning practical work as they possessed. They could not be expected to agree on all points, but let their criticisms be made at the Bureau meetings, and in a friendly way. At the Bureau meetings they should forget that they belonged to different political or other parties, and meet with the sole object of making the cultivation of the land more profitable. The success of the Bureau rests upon the members individually; if they do their duty the meetings would soon become popular. Most of the members agreed with the Chairman. Mr. Slater suggested that each member should make an effort to bring a friend with him occasionally, and all the members should show such visitors that they were welcome. If this were done he was convinced that they would soon have an increase in the number of visitors.

Branch Show.—On Easter Monday the second annual Show of the products of the district was held. The exhibits were numerous, and of excellent quality, particularly fruit and vegetables. The magnificent display of apples spoke well of the future of the young orchards in this locality. In addition to members of Port Elliot, Finniss, and Willunga branches, who exhibited various products, there were between 300 and 400 people present.

Dowlingville, April 7.

Present – Messrs. Illman (chair), Montgomery, Crowell, Mason, Grave, Phelps, Whittaker, Watkin, and Lock (Hon. Sec.).

Early Green Feed.—At previous meeting the question of best crop for early green feed was discussed. It was the opinion of the members that Cape barley and some kinds of rye were most suitable for this locality.

Best Wheats.—A long discussion took place on the best wheats for this locality, and the proper time to sow them. It was agreed that for early sowing Dart's Imperial, Smart's Pioneer, and a variety known locally as Ward's Improved were best; for late sowing, Steinwedel, Smart's Pioneer, and King's Early were favoured.

Woolundunga, April 14.

Present—Messrs. Greig (chair), Walker, Prosser, Foulis, Rogers (Hon. Sec.), and one visitor.

The Fig.—Mr. Rogers read a lengthy paper on "The Fig Tree and Its Uses."

Homestead Meetings.—This meeting was held at the residence of Mr. J. Greig, and after the business was concluded members were entertained by Mr. and Mrs. Greig, who were thanked for their kindness. Several members tabled exhibits of fresh and dried fruits.

Golden Grove, April 9.

Present—Messrs. McPharlin (chair), Milne, Mountstephen, Ross, Harper, and Coles (Hon. Sec.).

Cattle Complaint.—Mr. Mountstephen reported ailment in cows in his neighbourhood. A swelling appeared along the side of the body, the cow goes off her feed, and the milk supply falls off. If the animal scours within a few days she generally recovers.

Fodder Crops.—Mr. Harper tabled specimens of Cuzco maize 11 ft. in height. This was a very thick, heavy growth, but up to the present no cobs had set. [Similar experience is reported elsewhere; apparently this maize requires a long hot spell to produce seed.—Ed.] Mr. Harper also showed samples of holcus 12 ft. in height, and rib grass.

Hon. Sec.—Mr. Coles tendered his resignation, as he was leaving the district, and, in reply to a vote of thanks for his services, stated that the Bureau had been of very great assistance in helping him over the many difficulties that as a beginner at farming he had had to deal with.

Mount Gambier, April 11.

Present—Messrs. Mitchell (chair), Wedd, Dyke, Barrows, Norman, Wilson, Watson, Pick, Ruwoldt, and Lewis (Hon. Sec.).

Conference.—Matters in connection with the recent Conference were dealt with. Most of the members agreed that the exhibits by members of the Bureau would have been more numerous and educational if they had been staged at the Conference, instead of at the Show the day before. Showing them at the Conference would also have improved the attendance.

Potatoes.—A long discussion took place on various matters connected with the potato industry, more particularly in reference to preserving them in pits. It was admitted by all present that the potatoes would keep well if properly pitted, but some difference of opinion existed as to how they should be pitted. Some of the members had seen earth packed over the straw covering of the potatoes to keep out the wet, but Mr. Norman thought this unnecessary. He made the pit 6 or 8 in. deep only, put the potatoes not more than 3 ft. deep in the centre of the heap, placed logs on each side of the pit, and then put on a good covering of straw. His pits were 3½ ft. to 4 ft. wide. The question of black spot was referred to. It was stated that the disease was worst in sandy ground. Members thought the weather had a good deal to do with the prevalence of the disease. Water-blister was also bad in parts; especially at Yahl. Specimens had been sent to Adelaide to see if anything could be done to prevent the trouble. Mr. Ruwoldt stated that eight years ago the potatoes in one of his paddocks were badly blistered, and although no potatoes had been grown there since up to this year, the crop was again affected. The Chairman would like to know whether the disease occurred in other countries, and, if so, what was being done to combat it. The varieties of potatoes grown and their qualities were discussed. Amongst newer kinds exhibited at the Conference, Mr. Ruwoldt spoke highly of Bismarck (yield up to 20 tons per acre), Up-to-date (yielding as much as 12 tons locally), Wohltmann, and Thiele. While some members considered that the continued cultivation of the same variety resulted in marked deterioration, and Brown Rivers was given as a proof; Mr. Norman stated that he got as good a crop of this variety last year as any during the 20 years he had been growing it. It was generally agreed that changing seed from the sandy loam to black soil and vice versa was good practice. The potatoes from the black soil seem to possess a vigorous constitution. Seed from another country generally took two years to acclimatize.

Rust on Grass.—Mr. Wilson called attention to the spread of "red-rust" on the grass, principally on rye grass. Some members thought it would injure stock, but the Chairman said sheep seem to do well and fatten on the grass, notwithstanding the rust.

Arden Vale, April 13.

Present—Messrs. Warren (chair), Eckert, Francis, Fricker, Hannemann (Hon. Sec.), and three visitors.

Cultivation of Wattles and Saltbush.—The Hon. Secretary read short papers on these subjects.

Wattles.—The high price ruling for wattle bark should induce them to try to cultivate wattles where the soil was suitable. In many parts of the Flinders Range wattles are growing naturally, and apparently do well. Large quantities of bark have been stripped and sent away at different times, but unfortunately they could not get top prices for it. He had recently taken samples of a lot of about three tons to five different Adelaide buyers, and the best price offered was £3 per ton under top market rates. He left some with Messrs. John Reid & Sons, Limited, with a request that they would give the bark a thorough test, and the following letter from the firm explained the position:—"In reply to your desires of December 19, we have made a very exhaustive test of the tanning value of your bark, and we regret to report that it carries over one-third less tannin than best Adelaide hills bark. With the latter ruling at £8 a ton your bark works out at a little under £5 a ton in Adelaide. However, you can rest assured that whilst you forward bark equal to that of your last it will be worth £5 a ton, and as the bark market is not at all likely to fall for a long time you are, we think, quite safe to encourage wattlegrowing in your hills, if there is a margin of profit in £5 Adelaide to you; beyond this the younger wattles, if left long enough to fully mature, will be a better article than bark sent us, and thus worth more money." As freight from Quorn cost £1 4/ per ton, £5 only left £3 16/ to pay for stripping, collecting, and carting out of the hills, and then 25 miles by road to Quorn. This was not enough. The only thing to do was to find out why their bark was inferior. If the climatic conditions were to blame they could not help themselves; but it was possible they had not got the best varieties of wattle, and he suggested getting seed of the best kinds and trying them, as with better prices and a larger output he believed wattles could be profitably grown in many of the gullies through the far north.

Saltbush.—The drought during the past seven or eight years had taught the farmers many lessons, including the necessity for giving some attention to their native grasses and herbs, especially the saltbush. In California the Australian saltbushes were cultivated on a large scale, and with only four or five inches of rain during the summer the creeping saltbush (Atriplex semibaccata) had yielded large quantities of feed, besides seeding freely. The plants were cut for hay, and grew again very rapidly. A number of other varieties had been tested, but next to the one just mentioned the tall saltbush (Atriplex nummularia) was most valued. These plants should be cultivated by Australian farmers. Considerable discussion ensued, and it was agreed that in some portions of the north wattles might be grown with profit. All members were agreed as to the value of the saltbush, and the necessity for experimenting with the different kinds. It was decided to obtain seed of saltbush, and also of wattles for trial.

Davenport, April 2.

Present — Messrs. Trembath (chair), Lecky, Hodshon, Roberts, Tottman, McDowell, Tickle, and Pybus (Hon. Sec.).

Improving Usefulness of Branch.—The Hon. Secretary initiated discussion on the working of the branch. He spoke on the duties and responsibilities attached to membership, and urged that members should do all they could to lighten the duties of the Hon. Secretary. After much discussion, it was agreed that a programme be drawn up for the remainder of the year, and that in the event of any member finding himself unable to fulfil his engagement he should find a suitable substitute.

Caponizing.—A short discussion on caponizing poultry was initiated by Mr. Lecky.

Woodside, April 6.

Present—Messrs. Caldwell (chair), Low, Keddle, Drogemuller, Heidrich, Fowler, Rollbusch, Johnston, and Hughes (Hon. Sec.).

Adulteration of Commercial Products.—Mr. Heidrich read a paper on this subject. The patience shown by the hard-working producers in submitting to the unfair competition of adulterated products with scarcely a murmur was surprising. He would be far better off now if he only had to contend with the natural laws of supply and demand, but as it is he has to contend at almost every turn with adulterated articles of consumption which displace his own products, and which contain ingredients quite foreign to what the purchaser is led by the labels to expect. In many cases substances injurious to the public health are used by the manufacturers. Only recently the examination of so-called raspberry vinegar in Melbourne showed that three-fourths were concoctions of acids and essences, some of which were actually dangerous. In many other lines similar results would be shown on examination, and there was no reason to doubt that in South Australia the conditions were similar. It was well known in the trades interested that the various artificial essences, so closely resembling the natural in smell that the ordinary user would not detect the difference, were sold openly by the importers and others. There was absolutely no guarantee that our so-called "pure jams" were not adulterated. Their wines, so he was informed on good authority, as sometimes sold by the retailers, were at times something other than the pure juice of the grape. So it was with other lines of produce. Frequently the retailer is to blame, as he does not care what the article is made of so long as it looks and sells well, and he can undersell his rivals who are trading in the pure articles. He contended that the producer had the right to be protected against this unfair competition, and that the consumer was entitled to similar protection. Where the adulteration was harmless from a health point of view he would not object so long as the labels, &c., set forth clearly of what the goods consisted, as he was confident that in most cases the consumer would be prepared to pay a little more for the pure article. Any injurious substances should be totally prohibited in articles of food under a heavy penalty. He considered it was the duty of the Government of the State to give the desired protection to both producer and consumer, and the sooner the producers demand it the better for all. Members generally agreed with the writer of the paper on the necessity for Government action.

Bute, April 7.

Present—Messrs. Brideson (chair), Gitsham, A. and H. Schroeter, Stevens, Ebsary, Barnes, Hamdorf, Trengove (Hon. Sec.), and one visitor.

Stallion Tax.—Considerable discussion on this subject took place. The Chairman advocated a tax of £10 per annum on all stallions over two years of age, whether kept for hire or otherwise. Members agreed that the imposition of such a tax would prevent the many inferior horses travelling, and a resolution supporting the Chairman's suggestion was carried.

Koolunga, April 9.

Present—Messrs. Butcher (chair), Button, Shipway, Sandow, Burgess, Cooper, Atkinson, Butterfield, Noack (Hon. Sec.), and one visitor.

Poultry Tick.—An interesting discussion on this subject was initiated by Mr. Sandow, who had found it impossible to entirely eradicate the tick from his yards. The chicks when attacked soon succumbed if not attended to. He advised the use of movable perches; one good plan he had noticed had a vessel containing kerosine around each upright to prevent the ticks crawling up on to the perches. Mr. Butcher suggested using sheep dip, spraying the perches occasionally, and dipping the fowls in it to kill all vermin. Two or three members had noticed that they had large anthills near their henroosts, and they were not at all troubled with tick.

Forest Range, April 7.

Present—Messrs. Monks (chair), Vickers, Townsend, Hackett, Gunn, A., J., and F. Green (Hon. Sec.).

Prospects of the Apple Industry.—This was question night, most of the enquiries being on the apple industry. Spraying with arsenical compounds was considered to have proved a remedy against codlin moth, and the opinion was expressed that negligence on the part of the neighbours would not in future be a serious bar to treatment. Members were not prepared to express any opinion as to prospects of the continuance of remunerative market for apples in London. In planting an apple orchard of two or three acres, members would advise setting out about equal numbers of Margaret, William's Favourite, Emperor Alexander, Jonathan, London Pippin, Reinette du Canada, Rome Beauty, Cornish Aromatic, and Stone Pippin. Members were of opinion that in fruit orchards it was practically impossible to go to extreme in green manuring.

Strawberries. – Members considered that the nature of the soil was of greater importance than aspect in strawberry cultivation.

Binding Banks of Creeks.– Members wished to know what grass was best suited for cultivation on banks of creeks and dams to prevent washing o' erosion by water. [The experience of members of other branches on this point will be of value. The difficulty is that the best plants for binding river banks are objectionable in and difficult to eradicate from land intended for cultivation. For banks of dams, couch or buffalo grass will be found very useful.—Ed.]

Wandearah, April 6.

Present—Messrs. Robertson (chair), Birks, Stanley, Roberts, Dick, Davidson, E. H. and E. J. Eagle (Hon. Sec.).

Bunt or Smut.—Objections were taken to Early Para and Carmichael's Eclipse wheat, owing to their apparent susceptibility to smut. Mr. Dick said he knew of farmers who pickled the seed three months or more before sowing and got clean crops, whereas seed pickled just before sowing was a failure. Members thought this was evidence that to effectively destroy all the spores they must remain in contact with the poison for some time. It was unanimously agreed that bluestone pickling was an effective, and at the same time convenient, method of treating the seed.

Harrowing Wheat.—Difference of opinion existed on this point. Some would harrow before the wheat is through to kill the weeds and improve the tilth; others wait until the wheat is well through, while some of the members thought everything depended on climatic conditions; sometimes one and sometimes the other would be advisable.

Cherry Gardens, April 14.

Present—Messrs. Woods (chair), J. and C. Lewis, Richards, Partridge, Metcalf, Hicks, Broadbent, Burpee, Ricks (Hon. Sec.), and a number of visitors.

Boring for Water.—It was decided to endeavour to secure the use of a small hand-boring plant in order to test the district for water in several locations.

Molasses for Stock.—The Hon. Secretary stated that he had been using molasses mixed with dry feed for his cattle and working horses. The method adopted was to dissolve 3 lb. molasses in three quarts of boiling water, stirring well. When dissolved, add water to make four gallons, and sprinkle about a quart on the food for one cow. For horses he sprinkled the dry food with the molasses solution about 12 hours previous to using. His animals appeared to be doing well on this feed, and are very fond of the molasses.

Dairying.—Mr. G. S. Thomson, Dairy Instructor, gave an interesting address on dairying matters.

Mount Remarkable, April 9.

Present—Messrs. Jorgensen (chair), Challenger, Yates, Foot, McIntosh, Morrell, Casley, and O'Connell (Hon. Sec.).

Kerosine as a Medicine.—Considerable discussion took place on the use of kerosine as a medicine for stock. Most of the members had used kerosine in this way for years, while some of them stated that drovers and others in the back blocks used kerosine for all sorts of complaints of man and beast.

Ensilage.—Mr. Casley strongly believed in ensilage for summer use: most of the members agreed, but found the making of ensilage a very laborious operation, where proper conveniences are lacking.

Dairy Cows.—Mr. Jorgensen said he had been using a Jersey bull in his herd for some years, but considered he had lost by it, as the male progeny was unfit either for the butcher or for the teamster. They should breed good all-round cattle. Mr. Challenger urged the necessity for proper feeding, whatever the breed, in order to get the most profit.

Pickling Seed.—Members were of opinion that there was no difference in the germinating power of seed wheat pickled some time before seeding and seed pickled as required for use.

Rhine Villa, April 11.

Present—Messrs. G. A. Payne (chair), F. F. Payne, Start, Farey, Hecker, W. T. and J. W. Vigar (Hon. Sec.), and two visitors.

Cultivation on the Murray Flats.—Mr. Farey initiated a discussion on the folly of attempting to grow crops unsuited to the locality. This applied particularly to fruit-trees in dry localities. There was also a large area of land on the Murray Flats, from Rhine Creek to above Morgan, suitable only for grazing in large holdings, and on which it was impossible to grow wheat satisfactorily. Mr. W. T. Vigar thought there were very few farms in the district where wheat could not be profitably grown if early fallowing and manuring were practised. The Chairman said each one must experiment for himself in order to find out what produce he could raise at a profit.

Parkside, April 11.

Present—Messrs. Goodall (chair), Norris, Price, MacDonald, Meier, O'Grady (Hon. Sec.), and two visitors.

Attendance.—The apathy of a number of members of the branch was severely criticised, and it was decided that the Hon. Secretary report to next meeting, showing the attendance of each member during the past year.

Analyses of Fertilisers.—Considerable discussion took place on the publication by the Inspector of Fertilisers of the results of analyses of certain samples of fertilisers, showing serious discrepancies between the guarantees of the vendors and the actual analyses. Members desired to know what action the Government proposed to take in the matter, as the mere publication of the analyses gives no redress to the farmers, who have paid for the manures shown to be deficient.

Swan Reach, April 11.

Present—Messrs. Brecht (chair), Baker, Zadow, Fidge, and Harris (Hon. Sec.).

Handling Young Horses.—Mr. Fidge read a paper on this subject. A substantial yard was required in which to deal with the horse. He should be handled gently, and taught to lead well before being put to any work. To break him in to work, use him between two older quiet horses with the implements. Care must be taken to treat him kindly, and not to force him to work hard until he is fit to do so.

Inkerman, April 7.

Present—Messrs. Sampson (chair), Kennedy, Smart, Lomman, Angle, C. H. and C. E. Daniel (Hon. Sec.), and two visitors.

Cropping Stubble Land.—Discussion on this subject was continued from previous meeting. Several members stated that they always had fair results from the second year's crop, and were of opinion that with scrub lands it paid to crop two years in succession after fallow. It was also noticed that there was better grass after the second crop. The Hon. Secretary had noticed that where portion only of a field had been manured one year, and the whole area manured and sown the next year, the portion not previously manured yielded a better crop than the portion manured for two years in succession. Members thought this explained by the fact that the first year a bigger crop was grown on the manured area, and, consequently, more plant food was removed, and proportionately less left for the second crop. Some discussion ensued on the question of whether it was advisable to sow the same variety of wheat for two years in succession on the same land. Some thought that if the seed was procured from another locality it would not matter; while others did not think anything was gained by changing seed in this way. Mr. Kennedy pointed out that in breeding stock a change of blood was usually beneficial, and he thought with cereals it was beneficial to get seed from a different locality occasionally.

Wild Oats.—Mr. C. H. Daniels said they had noticed that of late years, since using super., wild oats had been comparatively scarce on their wheat lands. Some members thought that the wild oats had to a certain extent run out; others held that given a wet season, they would be as prominent as ever.

Reeves Plains, April 9.

Present—Messrs. J. G. Folland (chair), Richter, Worfel, Jenkins, Hancock Oliver, A. H. Folland, and McCord (Hon. Sec.).

Seeding.—Discussion on this subject took place. Mr. Jenkins said only fallow should be cropped in this district. The land should be in proper order before seeding was started. He liked to put the seed in as wet land as possible, as he always got better results by so doing. If there had been summer rains to start the weeds he considered seeding should be started after the first rains in April. Clean seed was an important essential. Late wheats should be put in first, and he believed in feeding off the crop with sheep. Messrs. Hancock and Richter generally agreed with Mr. Jenkins. Both would pickle all seed. Mr. Worfel thought pickling for hay crops unnecessary. The Chairman did not believe in feeding off the crop, as the sheep eat the wheat and leave the weeds. Deep sowing, especially in light land, was not advisable. He thought early sown crops most susceptible to black rust.

Kanmantoo, April 11.

Present—Messrs. Hair (chair), Lehmann, Lewis, E. and R. Downing.

Handling and Breaking Young Horses.—Mr. A. Hair forwarded a paper on this subject. The horse was the noblest, but often the most abused of domestic animals. Frequently in the city they would see horses, reduced to mere frames, staggering under the weight of heavy loads, with padding under the saddle to prevent it bearing on the too prominent backbones, and bags under the collars to prevent chafing of shoulders previously made sore through neglect or want of knowledge. His experience was that sore shoulders were usually caused at ploughing by working the horses too long hours at the start. If worked for a short spell only for the first few days, little trouble will be experienced. Horses that have been out of work for a considerable time will scald on the shoulders more readily than others. In such cases a false collar or bag will remedy it. The breaking of a colt should commence at weaning time, when a little handling and tieing up will accustom it to such treatment. When the actual work of breaking in was taken in hand he thoroughly believed in mouthing by means of the side rein—one side at a time. Drive the colt round the yard so that he answers to the side the rein is tied. If this is done for about 10 minutes each side, the two reins can be used, and it is surprising how readily he will answer to either rein. Colts trained in this way will always guide well. When starting the colt in harness always give light pulling at first, and long chains, so that he will not kick the swingle-tree when turning. When branding horses it is a good plan to blindfold them with a bag, as they will stand quieter. Kindness on the part of the trainer was most essential. Members generally agreed with the writer of the paper.

Clarendon, April 20.

Present—Messrs. Juers (chair), Phelps, Dunnill, Nicolle, A. and A. A. Harper, Payne, Spencer, Piggott, Wright (Hon. Sec.), and three visitors.

Destroying Blackberries.—Discussion took place on best means of eradicating this plant. One member had tried sulphuric acid without success; some thought that yarding pigs on the area infested would result in the destruction of the bushes.

Private Separator v. Factory.—Considerable discussion on this subject took place, both sides being well ventilated. Members generally agreed that if all the dairymen would support the factory properly, they would get more profitable returns than from private separators.

Morphett Vale, April 21.

Present—Messrs. Christie (chair), Benny, Jones, Goldsmith, Hutchinson, Pocock, Perry, Bain, and one visitor.

Seeding.—Discussion arose on question — Is it advisable to continue seeding operations while the weather keeps so dry? Members thought it was best to get on with seeding operations, and to trust to Providence for the seasonable rains.

Mixed Oats and Wheat for Hay.—Members advised mixing two bushels of oats to one of wheat—either Tuscan or Early Para—and to sow at the rate of 1½ bushels per acre.

Strathalbyn, April 20.

Present—Messrs. M. Rankine (chair), W. M. Rankine, Sissons, Watt, Cockburn, Gooch, and Cheriton (Hon. Sec.).

Breeding of Lambs.—Paper by the Chairman, read at recent Conference, was discussed, and it was resolved that the views expressed in the paper were worthy of adoption.

Winter Litters of Pigs.—Mr. Watt took objection to Mr. Molineux's statement in Farm Hints, in April issue of The Journal of Agriculture, that winter litters were seldom profitable or healthy. His experience was just the reverse. It was resolved that in the opinion of this meeting the most profitable and best method is to have litters all the year round, as by giving the sows a rest they often will not breed, and have to be fattened.

Tatiara, April 11.

Present—Messrs. Fisher (chair), Wiese, Rankine, Stanton, Penny, and Hughes (Hon. Sec.).

Manuring Pasture Land.—Discussion took place as to best method of distributing commercial manures on grass land, whether by means of drill or by broadcasting the manure and harrowing it afterwards. Most of the members favoured the drill.

Wheat Experiments.—Mr. Prescott forwarded report on results of experiments with different kinds of rust-resistant wheats. [Report was published in February issue.—Ed.]

VENTILATION OF FACTORIES AND WORKROOMS.

Contributed by the Chief Inspector of Factories.

(Continued from page 584.)

II.—Impurities from Lights.

The following analyses of the air in a room of 5,700 cubic feet and 11¾ ft. high, illustrate this point. All openings were closed, and only one person was present. Three No. 4 Union burners were lit, passing in all about 15 cubic feet of gas per hour. The gas jets were at a height of 6½ ft. from the floor, on the walls at opposite sides of the room. The samples were taken at the centre of the room. The temperature outside was about 9 deg. C.

	Volumes of CO_2 per 10,000.			Temperature C.	
	At 1 foot from floor.	At 4 feet from floor.	At 1 foot from roof.	At 4 feet from floor.	At 1 foot from roof.
Before gas lit	—	2.9	—	12.5°	12.5°
13 minutes after gas lit ..	—	—	13·8	—	—
18 ,, ,, ,, ..	—	4.8	—	—	—
24 ,, ,, ,,	7.5	—	—	—	—
30 ,, ,, ,, ..	—	—	20.2	—	—
36 ,, ,, ,,	—	9.0	—	—	—
44 ,, ,, ,, ..	12.7	-	—	—	—
53 ,, ,, ,, ..	—	13.9	—	—	—
59 ,, ,, ,, ..	—	—	27.7	—	—
64 ,, ,, ,, ..	16.5	—	—	—	—
68 ,, ,, ,, ..	—	17.4	—	—	—
90 ,, ,, ,, ..	—	—	34.3	—	—
96 ,, ,, ,, ..	—	19.4	-	—	—
102 ,, ,, ,, ..	19.6	—	—	15°	18.8°
140 ,, ,, ,, ..	—	—	39.0	—	—
144 ,, ,, ,, ..	—	25.8	—	—	—
148 ,, ,, ,, ..	24.8	—	—	15 4°	19.4°

(To be continued.)

◆

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of persons registered and found employment by Government Departments and Private Employers from March 28 to April 28, 1903.

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths	87	125	234
Masons and bricklayers	—	2	2
Carpenters	3	—	4
Boilermakers and assistants	3	—	—
Blacksmiths and strikers	2	—	—
Fitters and turners	2	—	—
Engine drivers and firemen	2	2	1
Moulders	3	—	—
Electrical Wiremen	1	—	2
Plumbers and ironworkers	2	—	—
Painters	2	1	5
Sawyers	1	—	—
Warders	3	—	—
Compositors	1	—	—
Farm hands	—	—	1
Sculleryman	—	—	1
Apprentices	6	1	1
Cleaners	—	1	—
Porters and junior porters	13	4	1
Rivet boys	—	—	1
Totals	131	136	253

April 29, 1903. A. Richardson, Bureau Clerk.

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No. 11. JUNE 1, 1903. VOL. VI.

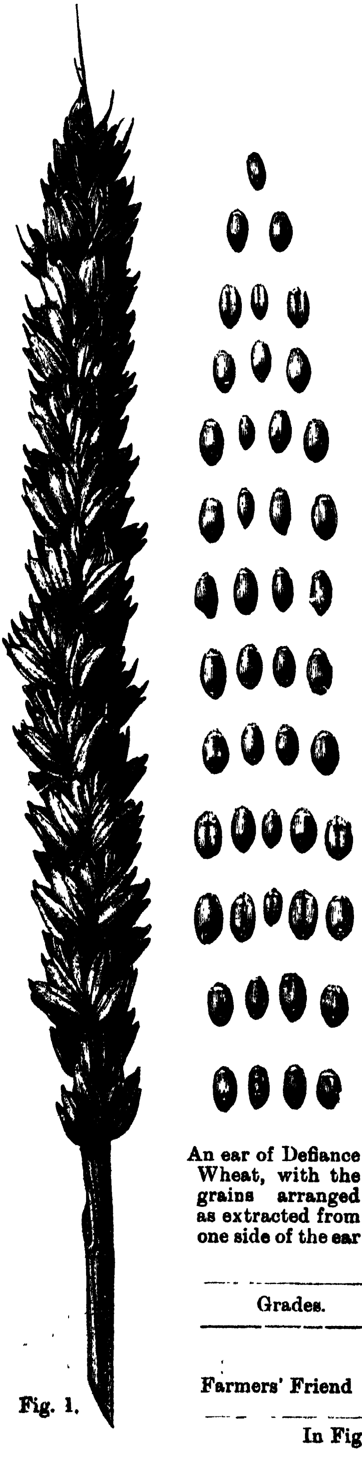
SEED WHEAT.

AN INVESTIGATION AND DISCUSSION OF THE RELATIVE VALUE AS SEED OF LARGE, PLUMP, AND SMALL SHRIVELLED GRAIN.

By N. A. COBB.

The publication of the results of Dr. Cobb's investigations in this direction places the agricultural community of the Commonwealth under special obligation to the Department of Agriculture of New South Wales. The problem which Dr. Cobb has sought to solve by definite experimental work might be summed up as follows:—Whether or not any appreciable advantage could be derived from the careful grading of seed wheat, i.e., from the elimination of the smaller and lighter grain at present found in average seed wheat. It is almost unnecessary to state that Dr. Cobb's reputation for thoroughness and scientific accuracy is well maintained in this his latest contribution. If, from the point of view of the general reader, there is any fault that can be laid to his charge, it is that in his anxiety to anticipate every objection that might legitimately be raised against his conclusions, he has, perhaps, overburdened his pamphlet with somewhat extraneous matter to the extent of interfering with the even tenor of its course. Similarly, perhaps, what to some may appear somewhat tedious repetition, is, after all, but the outward and visible sign of the truly scientific mind, anxious, above all, to avoid possible misconceptions, and at all times willing to sacrifice form to matter. We are not, however, called upon to dwell unnecessarily on the literary aspects of the question. We need note alone that the style is clear and concise, well calculated to express the results of experiments that should in the future influence to a considerable extent an important point in our farming practice.

That in the artificial rearing of plants and domesticated animals the principle of selection has at all times been consciously or unconsciously applied is nowadays a matter of common knowledge. In anticipation of possible criticism in this direction, Dr. Cobb demonstrates very clearly the raison d'etre of the investigations he was led to undertake. There undoubtedly lingers amongst the farming community of the world an almost superstitious reverence for small grain as seed; and of this fact I am able to add an example from my earlier experience amongst the less civilized Arabs of Northern Africa. By the aid of a very perfect grading machine—to which, by the way, Dr. Cobb makes only passing reference—I had prepared a high-class sample of seed wheat. I was soon relieved of the problem of profitably disposing of the smaller grain—for surrounding natives offered to accept it at the same price paid for the original sample prior to the removal



An ear of Defiance Wheat, with the grains arranged as extracted from one side of the ear

Fig. 1.

by grading of the larger grain; to them the smaller grain appeared more suitable for seed purposes. According to Dr. Cobb, such superstition is not unknown in New South Wales, and his figures having reference to the average sample of seed wheat used in the mother State eloquently support him in this contention. In 1897, just as seeding operations were in full swing, Dr. Cobb had some 232 samples of seed wheat collected for him in different parts of the State, and it is with an examination of their condition that his interesting pamphlet opens. As there existed no recognised standards of comparison, his first work consisted in determining and carefully defining standards by means of which seed could be judged. In the interests of uniformity it is to be hoped that these standards, that are the outcome of the labours of a competent worker, will be adhered to by future investigators.

By means of specially and carefully constructed sieves Dr. Cobb separated the grains of wheat into different grades, having reference to their greatest transverse diameter. His figures are given in millimeters (1,000 millimeters—39.37 inches), and the grades established, not inclusive of tailings, are six in number, arranged in the following descending scale: 3.25 mms. (—0.128 inch), 3.00 mms. (—0.118 inch), 2.75 mms. (—0.108 inch), 2.50 mms. (—0.098 inch), 2.25 mms. (—0.089 inch), and 2.00 mms. (—0.079 inch). For sake of simplicity we may omit the decimal point, and represent the various grades into which a given sample of wheat may be thrown by the following figures:—325, 300, 275, 250, 225, 200, and tailings.

It must not be supposed that small grain is exclusively the offspring of poor, ill-developed heads. Fig. 1 illustrates a well-grown head of Defiance, which, as will be noted, has yielded a great variety of grades of grain, although undoubtedly the larger prevail. This fact is still further emphasized by Table I., in which Dr. Cobb has graded the grain of a well-nigh perfect sample of an ordinary purple straw wheat. It will be noted that the smaller grades, although in marked minority, are not absolutely unrepresented. It should be borne in mind, however, as a significant fact, that in this case the two larger grades are represented by over 86 per cent. of the total weight of the sample.

Table I.

Grades.	325	300	275	250	225	200	Tailings.
	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
Farmers' Friend ..	46·96	39·63	8·01	3·79	1·09	0·29	0·23

In Fig. 2 the grading of this sample is illustrated.

In comparing the figures 2, 3, 4, and 5, illustrating respectively (A) a nearly perfect sample of the typical purple straw wheat (Farmers' Friend); (B) an average sample of the wheat used in New South Wales for seed; (C) an average sample of the seed sown by the best farmers in New South Wales; and (D) the condition in which three-fourths of the farmers in New South Wales sow their wheat, each graded according to the scale adopted by Dr. Cobb the following points should be carefully remembered:—That four years of careful experiment have demonstrated beyond any doubt that under the conditions prevailing at Wagga the greater the proportion of grades 325 and 300 in any sample the higher the average returns, and the heavier the grain per measured bushel; that there is no good ground for the belief that in respect to this matter of seed wheat South Australian farmers would come through a similar ordeal much if any better than their brethren in New South Wales; and that the probabilities are that if similar experiments were carried out here in South Australia the results from the different grades would be relatively the same.

Dealing with the quality of the samples tested, any containing a less total of the two top grades than 25 per cent. can only be regarded as medium to bad. As will be seen from figure 4, 57 of the samples which showed evidence of some attempt at cleaning averaged 48 per cent. of these two grades, and this should be regarded as the minimum of any sample that is sown for seed. We hope shortly to secure the necessary sieves for grading seed wheat according to the standard adopted by Dr. Cobb.

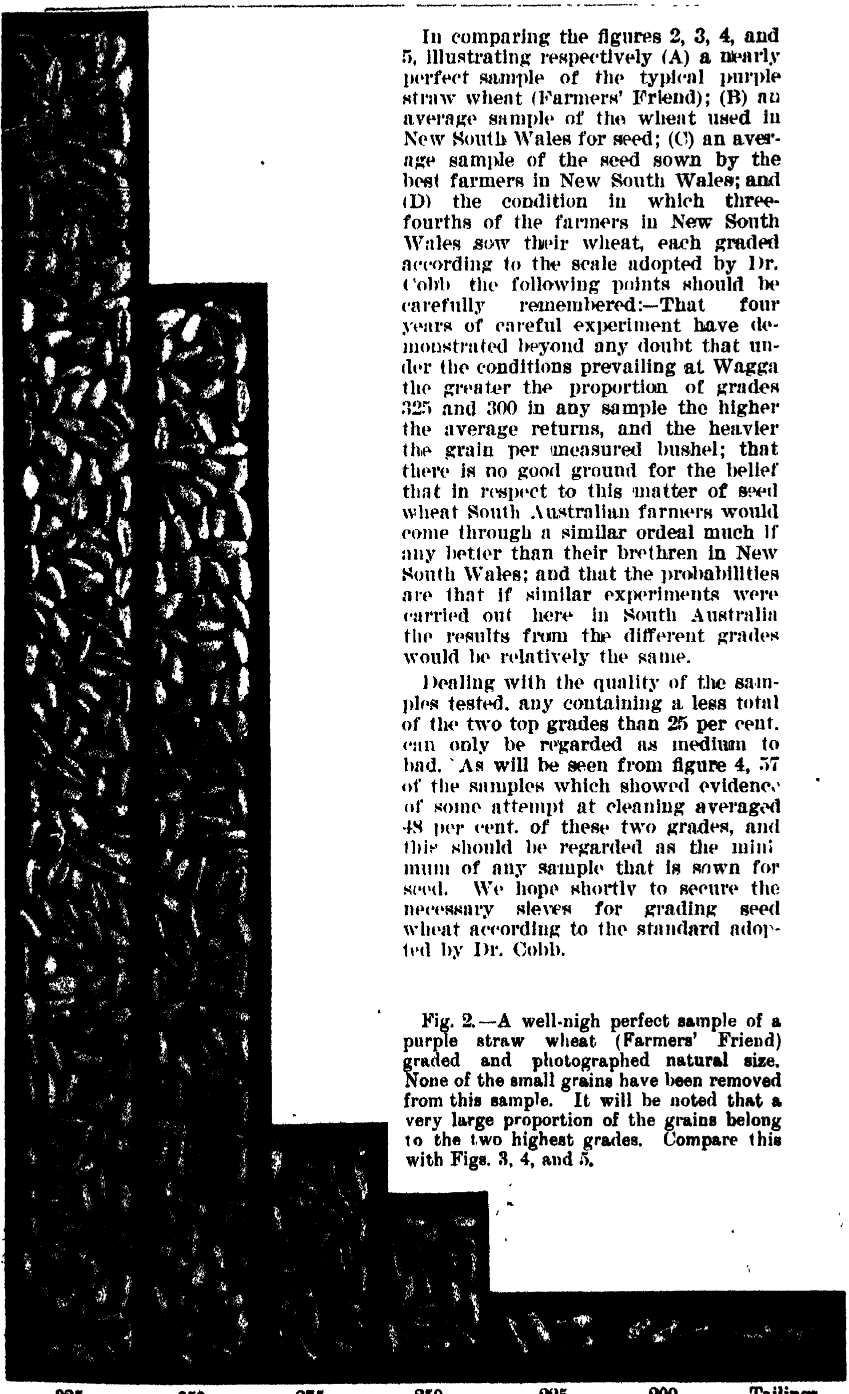


Fig. 2.—A well-nigh perfect sample of a purple straw wheat (Farmers' Friend) graded and photographed natural size. None of the small grains have been removed from this sample. It will be noted that a very large proportion of the grains belong to the two highest grades. Compare this with Figs. 3, 4, and 5.

How differently grades out the sample sown by the average farmer in New South Wales (and it is to be feared that critical enquiry would yield no better result in our own State) is well shown in Table II. Not more than 27 per cent. of the grain can be included within the two larger grades.

TABLE II. (ILLUSTRATED BY FIG. 3).

Grades.	325	300	275	250	225	200	Tailings.
	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
Average sample of seed wheat as sown in New South Wales ...	7	20	25	30	13	3	2

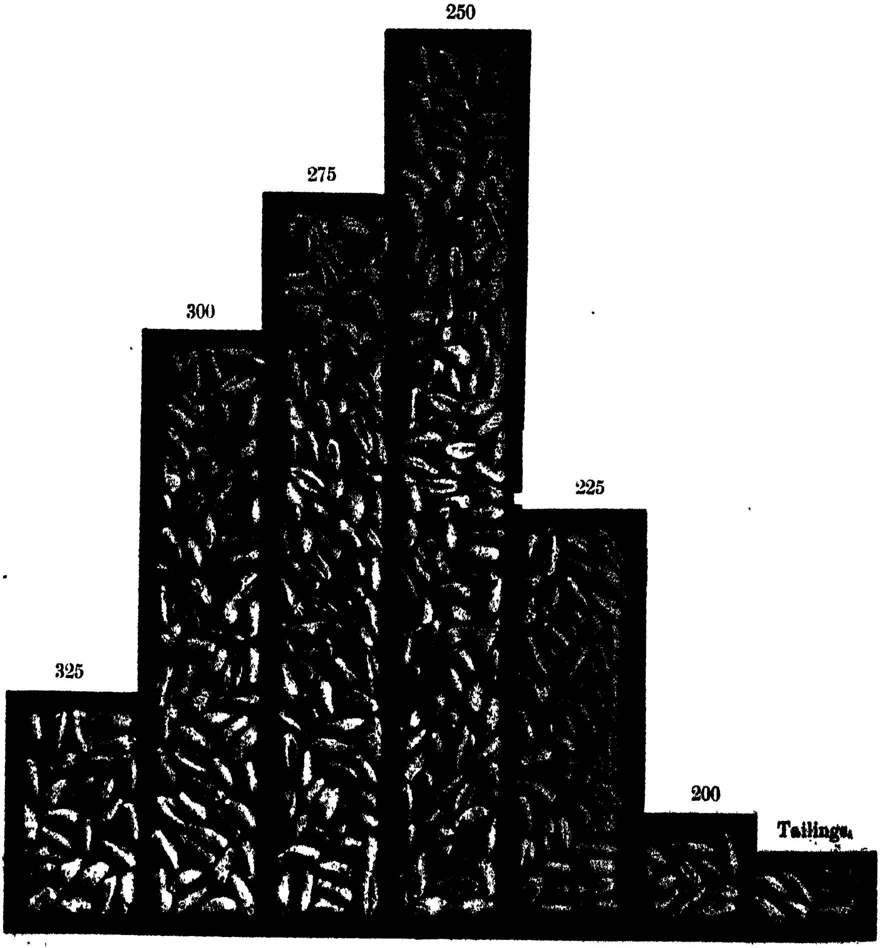


Fig. 3.—This shows the average condition in which wheat sown in New South Wales grades. Compare with Figs. 2 and 4, and note how in this sample the higher grades fall far short of both the others.

Out of the 272 samples of seed wheat submitted to him, Dr. Cobb was able to pick out 57 samples of manifestly superior quality. These he has averaged in Table III., as representative of the practice of the better farmers of New South Wales. This table shows that nearly 50 per cent. of the grain sown would be included within the two larger grades.

Table III. (Illustrated by Fig. 4).

Grades.	325	300	275	250	225	200	Tailings.
	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
Average sample sown by best farmers in New South Wales.	15·8	32·4	27·7	18·8	3·8	0·8	0·7

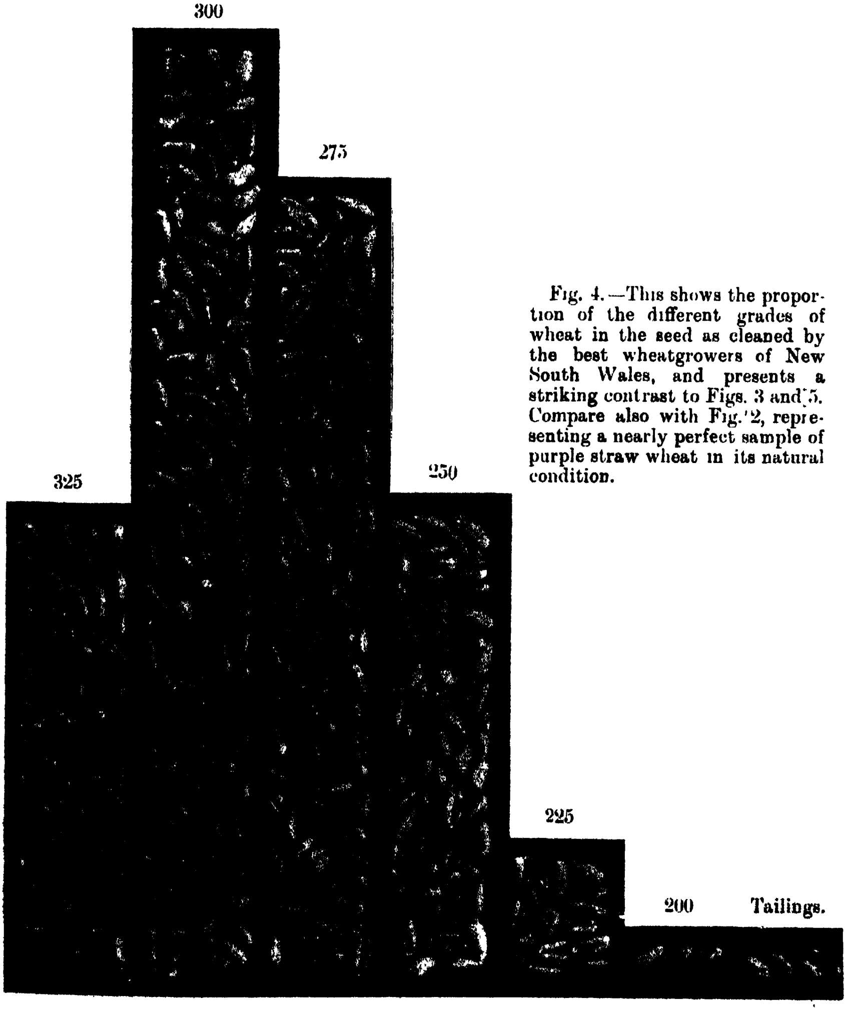


Fig. 4.—This shows the proportion of the different grades of wheat in the seed as cleaned by the best wheatgrowers of New South Wales, and presents a striking contrast to Figs. 3 and 5. Compare also with Fig. 2, representing a nearly perfect sample of purple straw wheat in its natural condition.

The examination of certain individual cases yielded of course results superior to those given in Table III.; indeed, in consequence of the removal of the smaller grain, superior even to Dr. Cobb's perfect sample of purple straw. Thus, in one sample from Yass 88 per cent. of the grain was included in the two higher grades; in another, from Bective, 81.3 per cent.; and in another, from Nemingha, 81.2 per cent. Such figures imply very perfect methods of preparation of the seed wheat.

Finally, in Table IV. is shown the wretched condition in which three-fourths of the farmers of New South Wales blindly scatter their seed over the ground. Under 21 per cent. of the grain is included within the two larger grades.

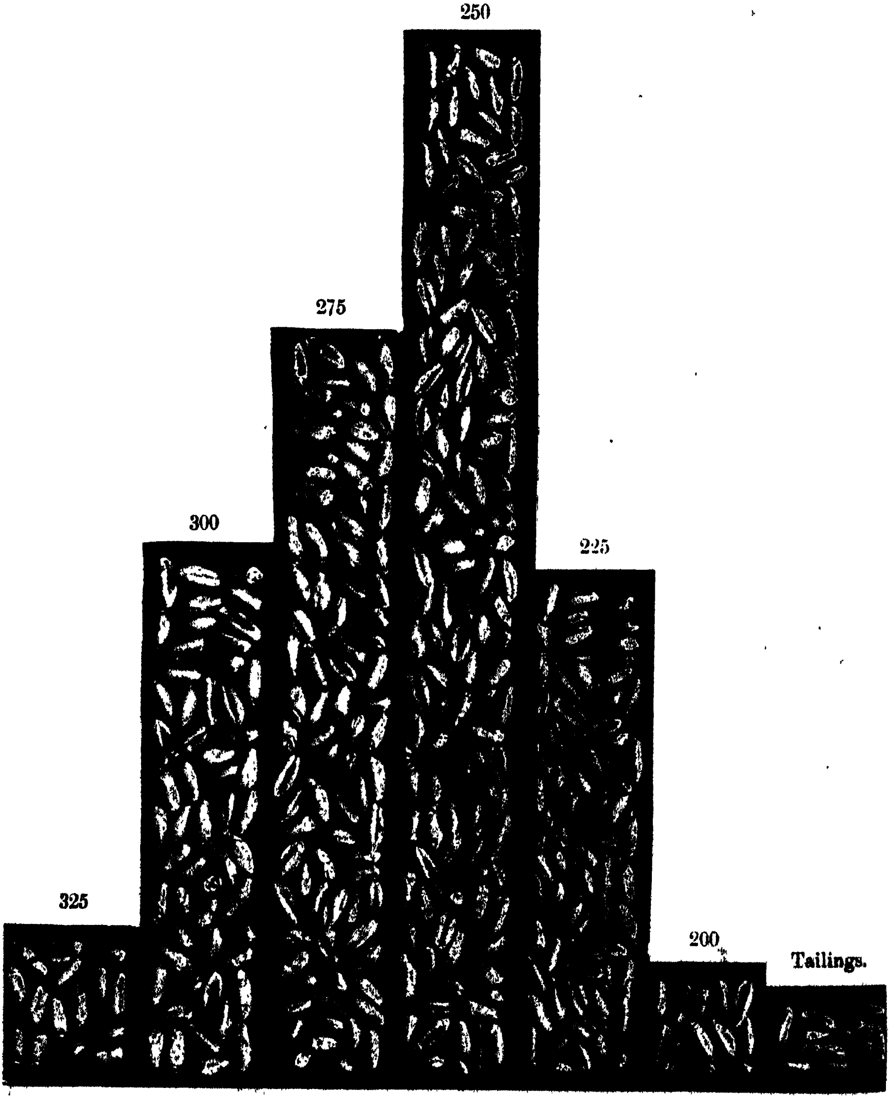


Fig. 5.—This shows the condition in which the great majority of the farmers sow their wheat. Fully one-half of the grain belongs to the grades shown by Dr. Cobb's experiments to be decidedly inferior for seed purposes.

TABLE IV. (ILLUSTRATED BY FIG. 5).

Grades.	325	300	275	250	225	200	Tailings.
	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
Condition in which three-fourths of New South Wales wheat is sown	4	16·8	24·7	33·7	15·7	3·1	2

We may summarize the above results in a single table in the following manner:—

TABLE V.

Grades.	325	300	275	250	225	200	Tailings.
	per cent.	per cent	per cent.	per cent.	per cent.	per cent.	per cent.
Perfect sample purple straw, including large and small grain ..	46·96	39·63	8·01	3·79	1·09	0·29	0·23
Best sample seed wheat examined by Dr. Cobb	40·8	47·2	10·5	1·5	nil	nil	nil
New South Wales average seed wheat ...	7	20	25	30	13	3	2
Average seed wheat as sown by best farmers in New South Wales	15·8	32·4	27·7	18·8	3·8	0·8	0·7
Average seed wheat as sown by three-fourths of farmers in New South Wales ...	4	16·8	24·7	33·7	15·7	3·1	2

From the above summary we may draw the following conclusions:—(1) Well-grown wheat plants will throw a largely preponderating proportion of large grain; (2) the practice that obtains in advanced agricultural communities of eliminating small grain from seed wheat has been recognised as advantageous by an appreciable proportion of New South Wales farmers; there can, therefore, exist no economic obstacle to its adoption by the majority; (3) the great majority of New South Wales farmers ignore grading altogether, and apparently show a marked preference for small grain (and let not our modesty prevent us from extending this last conclusion to ourselves).

Having carefully established these premises, Dr. Cobb proceeded next, in a series of carefully conducted experiments, extending over four years, to test large grain against small grain. In conducting these experiments he adopted the row system in preference to the plot system; and those who follow him in his arguments in favour of this plan will, I believe, generally agree with him that where the object in view renders necessary the complete elimination of outside disturbing influences, he could not have made a wiser choice. Dr. Cobb points out that when large plots are pitted against large plots, disturbing influences, arising from soil and subsoil, from climatic factors, are so great as frequently to completely obscure the main results one may have in view. So as to reduce the action of such influences to a minimum, the various grades of wheat were represented by single rows, the results from which were compared only with those yielded by neighbouring rows on either side, and situated at 16 inches from the central row. This arrangement is illustrated in fig. 6. As in all such cases, the disturbing influence of weeds had to be taken into consideration: had their distribution been of an even nature, Dr. Cobb states that, with a view to approach as nearly as possible the conditions that

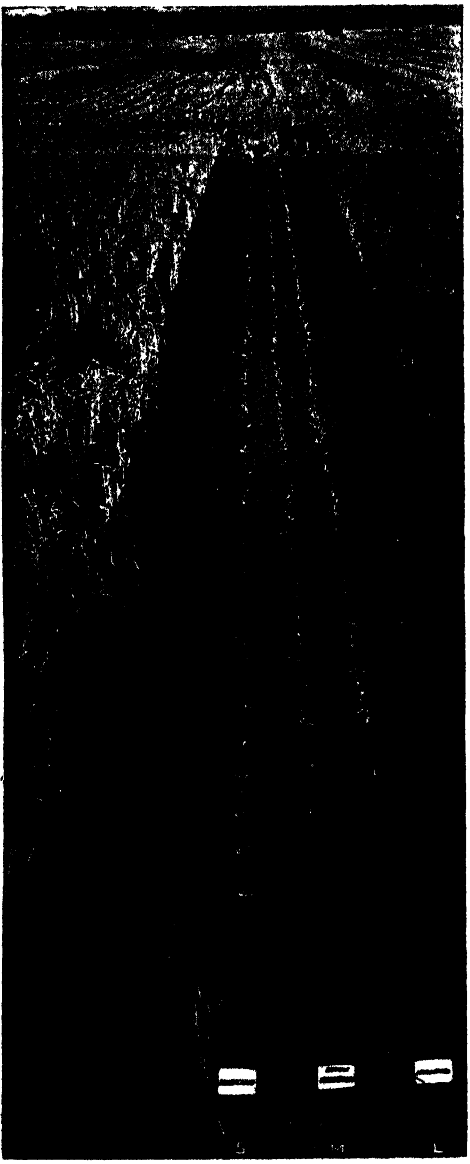


Fig 6.—Photograph of three rows of experiment wheat after harvest. The rows are from large, medium-sized, and small grain, and are lettered respectively L. M. S. The picture shows the relative amounts of straw from the various rows, and also the greater proportion of "misses" of the smaller seeds.

obtain in ordinary practice, he would probably have left them alone. Unfortunately, such is not the habit of weeds, and it was therefore found necessary to carefully remove them by hand throughout the course of the experiments. Dr. Cobb very rightly points out that this operation, imposed upon him by circumstances, was on the whole all in favour of the small grain, as later results proved them to give rise to plants less able to resist adverse conditions, such as competition from weeds would certainly tend to create.

* * * * *

I might wish to be in a position to give a detailed account of Dr. Cobb's interesting experiments; the exigencies of space, however, forbid any such attempt, and I must perforce rest satisfied with the briefest of summaries, referring readers for further details to the original pamphlet. The results secured by Dr. Cobb may be described as uniformly demonstrating the superiority of large, plump grain over small or shrivelled grain; and in view of the fact that during the five years over which the experiments extended, considerable variations in soil and climate conditions obtained, and an ample assortment of typical varieties came under examination, we should, in my opinion, have no hesitation in admitting that similar unrecorded results are of daily occurrence in our ordinary practice.

The superiority of the plump grains, or large grades of wheat, was apparent in every line. In the first place the proportion of plump grains that germinated, or, rather, the proportion that succeeded in developing well-grown plants, proved always to be considerably in excess of that obtaining amongst the smaller grades. Thus, if we take as an example results from the third trial—

Out of 2,400 grains of the extra large, or 325 grade, 90.0 per cent. grew.

Out of 5,800 grains of the large, or 300 grade, 90.9 per cent. grew.

Out of 5,800 grains of the medium, or 250 grade, 87.0 per cent. grew.

Out of 5,800 grains of the small, or tailings, 77.8 per cent. grew.

The above figures do not imply that all the plants bore seed, but merely that they were of sufficient size to be harvested and weighed. With reference to the tailings, Dr. Cobb points out that they are not at all comparable to farmers' tailings; the latter usually consist of cracked grains and foreign matter, that cannot be counted as seed. The tailings of Dr. Cobb's experiments consist merely of small, more or less shrivelled, grain, each of which is otherwise perfectly developed. In the circumstances it is perhaps to be regretted that he has made use of a term that may lead to confusion of ideas. In ordinary practice, where the wheat plants have to struggle with weeds for possession of the soil, there is little doubt that in virtue of the greater vigour of plants issued from the higher grades, there must exist a still greater disproportionality in the relative power of the various grades to produce full-grown plants than is indicated by the figures above. At all events, we have here already one factor tending to neutralize the effect of a greater number of grains for a given weight of seed, that is sometimes claimed as an advantage for small grain.

Secondly, the yields of the larger grades were in by far the greater number of cases considerably superior to those of the smaller grades, with which they were compared. In view of the very large number of trials conducted in this direction by Dr. Cobb, it is impossible for me to do justice to his results without quoting extensively, and beyond the limits of available space. I must content myself with referring briefly to the summary of results of the third trial.

Grade 325 excelled 58.3 per cent. trials by 12.9 per cent.

Grade 300 excelled 93.1 per cent. trials by 26.5 per cent.

Grade 250 excelled 86.2 per cent. trials by 40.5 per cent.

By this is meant that in the tests betwixt grades 300 and 250, grade 300 excelled in 93.1 per cent. cases by 26.5 per cent.; so that if we assume that grade 250 yielded 20 bushels to the acre, grade 325 yielded more than 25 bushels in over nine-tenths of the tests. A similar method of reasoning may be applied to the other grades when compared with those immediately below them.

Thirdly, analogous results were secured when the weights of straw obtained from the various grades were taken into consideration. Thus, for the third trial previously referred to, Dr. Cobb gives the following figures:—

Grade 325 excelled in 66.7 per cent. trials by 19.2 per cent.
Grade 300 excelled in 89.7 per cent. trials by 29.6 per cent.
Grade 250 excelled in 93.1 per cent. trials by 40.7 per cent.

Fourthly, Dr. Cobb's experiments go to prove that plants sprung from the larger grades show a tendency to throw a greater proportion of large grain than those sprung from the smaller grades. The seed is also generally fuller and plumper.

Fifthly, Dr. Cobb has ascertained that in all cases the weight per bushel of grain from plants of the higher grades is always in excess of that of grain from plants of the lower grades.

Finally, Dr. Cobb maintains that if small and large grain are sown together, the latter will give rise to plants several inches taller than the former, hence irregular stripping or threshing.

Briefly, Dr. Cobb's experiments prove that seed wheat from which the smaller grain has been eliminated will ensure more perfect germination, more regular seeding, hardier and healthier plants, heavier yield of grain and straw, and a finer and heavier sample of grain. In the circumstances it can be added that our wheats, if properly selected from the beginning, should, instead of deteriorating, tend to improve with every harvest.

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It should, of course, be noted that in all these tests an equal number of grains, and not an equal weight, or an equal volume, of the different grades have been tested one against the other. Dr. Cobb points out that he desired to ascertain whether the larger grain would give rise to better plants and heavier yields than the smaller grain. There is no doubt that his experiments definitely prove this to be the case. In the circumstances, he adds, very justly, that it must prove more advantageous to sow a slightly heavier weight of large grain than a lesser weight of small grain. Nor in this connection should the reduced power of maturing healthy plants which characterizes small grain be lost sight of. In proportion to the results at harvest time, the extra cost of grading is comparatively insignificant. There is no call upon the farmer to grade the whole of his crop; let him, on the advice of Dr. Cobb, select the finest grown patch in his fields; let him keep the winnowed grain separate from the bulk of the harvest and grade it at his leisure before seeding time. The small grain is by no means lost, for according to Dr. Cobb's own researches, and those of others, its feeding value, though not its milling value, is practically equal to that of large grain.

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I cannot close this brief review without reference to one of Dr. Cobb's statements, which will require confirmation by a very extensive series of experiments before it can receive general acceptance. After proving that if properly kept seed wheat will retain its full vitality for at least five years, he recommends setting aside for seed grain reaped during exceptionally good years as a standby for years when, owing to defective climatic conditions, the seed available in a district is of inferior quality. With the latter view some may perhaps be inclined to agree, but when he goes on to state that he has "fairly satisfactory evidence that seed from another district is not likely to be advantageous on a well-conducted farm, unless, in addition to the seed being well grown, the district be also similar in soil and climate," I am afraid that he will meet with more opponents than adherents. True, this may be another prevalent agricultural superstition, but I fancy it will prove harder to kill than the small-grain superstition. It is not for a moment argued that extreme climatic changes must be productive of good results; but not only by wheatgrowers but by growers of all types of plants, changes of seed, involving slight differences in climate and soil, such as obtain in districts of the same country, have at all times been looked upon as not only productive of beneficial results, but in certain cases as an absolute necessity to the yield of good average crops. I shall await with interest what evidence Dr. Cobb may bring forward to prove that locally grown seed must at all times prove superior to seed grown elsewhere under slightly different conditions of soil and climate.

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Dr. Cobb closes an exceedingly interesting and instructive pamphlet by referring to the machinery available for grading wheat. To this I shall at present make no reference, as I purpose dealing with the matter at a later date. We are indebted to the New South Wales Department of Agriculture for the loan of the blocks illustrating this article.

ARTHUR J. PERKINS.

IRRIGATION ON THE MURRAY: UTILISATION OF THE SWAMP LANDS.

By ARTHUR J. PERKINS, SECRETARY FOR AGRICULTURE

(Continued from pp. 494, 536, and 595.)

THE SALT QUESTION.

Saline matters injurious to vegetation, whether actually present in the soil in hurtful proportions, or whether their future accumulation therein be merely indicated by surrounding conditions constitute under climatic conditions such as ours a standing menace to irrigated lands. For it is practically the outcome of the world's experience that the "salt" question is almost inseparable from the irrigation of localities in which rainfall is scant, summer temperature high and abnormally protracted, and inferentially soil evaporation excessive. It has proved the stumbling block in the more arid portions of California and North Africa, and here higher up the river at Mildura and Renmark we have it on record that Nature has not deigned to abrogate her laws in our favour. It may, in fact, be asserted with tolerable accuracy that the tracts of flat land lying to the north of Adelaide are all more or less rich in saline constituents, that in a slightly higher degree of concentration must necessarily make their influence felt on plant life. Doubtless we have here one of the reasons that has rendered proverbial the health of the live stock that are depastured over these vast plains. It is a matter of common knowledge that soils derive their physical and chemical characteristics from the rocks, the disintegration of which has brought them into existence. The presence, however, of "salt"—and I use the term in its common generic acceptance—over a vast tract of country, and in the most diverse of soils, serves to emphasize the fact that it has been called into existence more by special and common climatic conditions than by the composition of the rocks that have contributed in their gradual weathering towards the formation of the soils.

Before extending our enquiry to irrigated lands, let us endeavour to account for the rise of "salt" in ordinary tilled or untilled land under the special climatic conditions already succinctly described. And, first, we must note that under the term "salt" we include a variety of substances, all more or less soluble in water—various chlorides, sulphates, and carbonates, generally of sodium and magnesium. Traces of some of these substances may be said to be present practically in all soils and under all climates, and in their ubiquity they are not generally characteristeric of any special rock formation. Special deposits of rock or other salt make, of course, exception to this general rule And thus the opinion not uncommon here that would frequently attribute the sudden and otherwise inexplicable failure of a tree or shrub to the meeting of the roots in their downward course with a layer of soil unusually rich in salt, is not generally justified. It is in the surface layers that the mischief is done, for it is here that special climatic conditions tend to accumulate the "salt." In heavily watered countries, where running streams abound, Nature purges a soil of salt through rivers that carry to the sea the surplus drainage waters. In countries where rainfall is scarce and evaporation intense, rivers are rare and drainage practically nil. Rain falls on the surface at distant intervals of time, and penetrates the soil to moderate depths; intense sun heat that rapidly follows, and violent winds that rage unhindered over the unprotected plains soon mop up what moisture the surface soil may have retained. The latter then makes call on the reserves of the lower depths. By capillarity the subsoil moisture, now more or less charged with soluble saline compounds, ascends to the surface, is evaporated, and leaves in the upper layers what had previously been dispersed over the bulk of the soil. This process is continuous, and in the course of centuries results, under climatic conditions that favour it, in the accumulation of salt in the surface layers. Dense vegetation, by replacing surface soil evaporation by plant evaporation, and by screening the soil from intense heat, tends to keep in check the rise of the salt. Unfortunately such vegetation does not usually characterize climatic conditions of the type we have in view; or, at all events, it is but short lived, and leaves the plain bleak and bare at those times of the year when evaporation is most intense and the rise of salt most marked.

Tillage, when well conducted, must necessarily tend to minimise the evil. Winter operations, ploughing, scarifying, &c., by stirring and mixing the land, help to spread over a greater bulk of soil the salt deposit that summer evaporation had left on the surface. The summer cultivation of fallow land, by reducing evaporation to a minimum, must also check the rise of saline matters. Nor must we forget the action of the thicker and more luxuriant vegetation that the soil yields under cultivation, and that is periodically removed from it in the form of fodder or grain. The different substances that we denominate "salt" are, perhaps, not essential to the development of plants, even in the most pronounced state of dilution. They are, nevertheless, soluble, and some portion of them must pass into the tissues of plants during the period of growth, and are thus in part removed from the land. After all, it is only the presence in the soil moisture of salt in a state of concentration more or less pronounced that the plants fear.

If tillage and the growth of cultivated plants tend to check the dangerous accumulation of salt, the same cannot, unfortunately, be said of irrigation as it is usually practised. It may, in fact, be said that under climatic conditions rendering inevitable this phenomenon, irrigation only helps to accentuate it. Particularly is this true when it is shrubs or trees that the irrigated land carries, leaving it as they do naked and unprotected throughout the year The soil generally receives the water during the drier and hotter portions of the year when evaporation is more intense; no provision is usually made for artificial under-drainage whereby the surplus salt-laden moisture might be removed; subsequent tillage is not always as perfect as it should be. And thus during a time of the year when their action is most potent, we find united many factors, the ultimate effect of which is to multiply many fold the already hurtful action of the unaided winter rains. Replace, however, shrubs and trees by a thick sward of grass, a field of lucerne, or any other association of densely growing plants, and the baleful effect of soil evaporation disappears and with it the appearance of salt in the surface layers. It may well be asked are we justified, when confronted with climatic conditions that render irrigation indispensable, are we justified in tilling our orchards and vineyards on the lines that obtain in districts in which irrigation is not in use? Were it not wiser to allow, nay to encourage, during the summer months an undergrowth of dense vegetation that could be ploughed under from time to time? This practice would, perhaps, absorb greater quantities of water, but the soil would be enriched, and, what is of equal importance, the rise of salt would be effectively checked.

Here in the swamp lands the influences with which we have hitherto dealt, and to whose agency the formation of salt patches can usually be ascribed, cannot have been at work prior to the advent of the disturbing hand of man. Now completely immersed under a sheet of water of moderate depth, now sheltered beneath the rapid and luxuriant growth of semi-aquatic plants, the swamp surface can in the past have felt but little of the baleful action of intense soil evaporation. And if at the outset I have touched, however briefly, on this aspect of the "salt" question, it is not so much from a belief in its possible bearing upon the present state of the swamps, as from the conviction that its influence on the future is inevitable; for, once reclaimed, the swamps can no longer hope to escape the fate that is normal to adjacent but less favoured lands. For the salt that may be detected in the soil at the time of reclamation we may infer almost even distribution throughout the depths of the swamp, and we must seek its origin in the waters that have periodically flooded the latter from time immemorial.

The soil that was forwarded me by Messrs. Morphett & Co. cannot be looked upon as virgin swamp soil. Two or three years' reclamation has probably not been without special modifying influence. From the point of view of the salt question it would no doubt be of interest to compare this soil with that of the virgin unreclaimed swamp. This, however, we are not at present in a position to do. Unfortunately I had not at the time a quantity of soil sufficient to render the investigation as complete as I could have wished. From what was available the following data were supplied me by Mr. Chapman:—

TABLE V.

Injurious Constituents in Swamp Soil at Wood's Point in Terms of Soil Dried to 105° C.

	Expressed as percentages of soil.	Expressed as lbs. per acre of 3,250,000 lbs. weight
	per cent.	lbs.
Chlorine	0 066	2,145
Magnesia (Mg O)	0 100	3,250
Soda (Na_2O)	0·090	2,925

The proportion of chlorine given in Table V. in combination with sodium would represent about 0.109 per cent. of sodium chloride, or common salt, or about 3,542 lbs. of common salt to the acre. We find ourselves, therefore, within the danger limit indicated by Messrs. Guthrie and Helms' experiments, that were summarized in this volume, p. 536. The authors state with regard to wheat that "with from 0.05 to 0.1 per cent. of common salt, germination is somewhat retarded; the plants are less vigorous, but recover and grow well." On the other hand, the experience of other countries goes far to prove that plants will frequently tolerate from 5 to 10 times that amount of salt providing the soil is maintained in a suitable state of humidity, and excessive soil evaporation is checked. The danger, as has already been pointed out, lies in the concentration of the salt in the surface layers; and this I hope to show can readily be avoided here. I infer, therefore, that the amount of salt at present found in the swamp soil is not likely to exercise an injurious effect on plant life, always providing irrigation be judiciously managed.

The detection of salt in the arable portion of the swamp cannot, however, but remain a matter of some anxiety. It may well be asked whether in the future it may not show a tendency to accumulate beyond the point of endurance of plants. Although I cannot pretend to be in possession of all data necessary to the elucidation of this question, I am in a position, I believe, to forecast fairly accurately the future trend of events. Towards the end of this article I shall endeavour to show on what lines future investigations could be profitably conducted.

Let me first recall the fact that the swamp slopes gently back from the ordinary river channel towards higher cliffs that help to confine the rising waters at flood time. Prior to reclamation, as a flood subsided, the waters gradually drained off to the back of the swamp, where, in all probability, they came under the influence of more or less intense evaporation, at a time when the higher levels were rapidly clothing themselves with verdure. It is a fact of universal experience that no running waters are absolutely devoid of soluble salts; and these retreating waters, left ultimately to evaporate at the back of the swamp, can have formed no exception to the rule. Part they owed to what the river had acquired from contact with earth on its seaward journey, and part from more or less lengthy contact with the upper levels of the swamp during their slow and gradual retreat towards their final resting place. We have, therefore, here special conditions tending to favour the accumulation of salt on the lower swamp levels, and Messrs. Morphetts' experience confirms what one might have been led to suspect. For reclamation and irrigation of the higher levels can by no means be looked upon as tending to check this tendency; in fact, it is not unlikely that they may help to accentuate its effects. Like the flood waters of the past, the irrigation waters, after supplying the soil with what moisture it can retain, take advantage of the great porousness of the latter and gradually drain off to the back of the swamp, bringing with them a new quota of salt; and as irrigation is constant and regular, whilst floods were spasmodic, it is probable that the yearly amount of salt at present carried to the back of the swamp is in excess of what obtained in pre-reclamation days. In effect, Messrs. Morphett have found it impossible to germinate mangels in the neighbourhood of the lower level, and thick incrustations and efflorescences that cover the surface as soon as evaporation has made itself felt testify eloquently to the presence of salt in some form or other. These efflorescences are of two types—in one case they form a hard white crust, and in the other a loose ashy powder. Both were analysed by Mr. Chapman, the results of whose analysis are given in Table VI.

TABLE VI.

ANALYSIS OF SALT INCRUSTATIONS AT WOOD'S POINT.

	Hard Crust.	Ashy Powder.
	per cent.	per cent.
Magnesium Sulphate	22·40	0·12
Sodium Chloride	19·13	13·37
Sodium Sulphate	3·90	—
Calcium Sulphate	1·64	3·82
Magnesium Chloride	—	6·31
Total Soluble Salts	47·07	23·62

The water that has been used for irrigating the upper levels drains off to the back of the swamp. I have therefore thought that an examination of these drainage waters would not be without interest. I therefore asked Messrs. Morphett to forward me some of this water from a hole opened out on the lower levels of the swamp. Had I at the same time asked for a sample of the water as it reached the upper levels for purposes of irrigation, we should, no doubt, have had the terms of an interesting comparison. Unfortunately this view did not occur to me until it was too late to act upon it. In Table VII. are given the saline constituents present in the drainage waters last February. In the first column they are expressed in grammes per litre; in the second in grains per gallon; in the third as percentages of the total soluble salts; in the fourth, for reasons given lower down, are shown the proportions of the same salts in average sea water.

TABLE VII.

SALINE MATTERS CONTAINED IN DRAINAGE WATERS AT WOOD'S POINT IN FEBRUARY, 1903, COMPARED WITH SEA WATER.

	Saline matters in Wood's Point Drainage Waters.			Saline matters in average Sea Water expressed as percentages of total.
	Expressed as grammes per litre.	Expressed as grains per gall.	Expressed as percentages of total.	
Sodium Chloride ..	4·506	315·45	49·945	77 758
Magnesium Chloride ..	absent	absent	absent	10·878
Magnesium Sulphate ..	2·514	176·00	27·865	4·737
Calcium Sulphate ..	1·535	107·44	17·014	3·600
Sodium Sulphate ..	0·132	9·24	1·463	absent
Calcium Carbonate ..	0·335	23·50	3·713	0·345
	9·022	631·63	100·000	—

Table VII. amply accounts for the presence of saline efflorescences at the back of the swamp. The drainage waters are rich both in magnesium sulphate and sodium chloride, derived probably for the greater part from irrigation waters supplied by an abnormally low river.

In the fourth column of Table VII. I have for special reasons inserted the proportions in which the various salts are present in average sea water. It will be noted that whilst in sea water sodium chloride (common salt) is represented by 77 per cent. of the total salts, magnesium chloride by 10 per cent., magnesium sulphate by 4 per cent., calcium sulphate by 3 per cent., and sodium sulphate is apparently absent, in the drainage waters at Wood's Point sodium chloride is represented by 50 per cent., magnesium sulphate by 27 per cent., calcium sulphate by 17 per cent., sodium sulphate by 1½ per cent., and magnesium chloride is apparently absent. These differences are certainly striking, the abnormal richness of the drainage waters in magnesium sulphate, and the absence of magnesium chloride go far to disprove any possible admixture of sea water, at all events in this part of the river. That at periods of low river the laws of Nature are reversed, and the sea flows up stream, is an opinion tenaciously held by some, and of which we are said to have had a striking instance during the past summer. Whether or not those who hold such views have deigned to take into consideration the insurmountable difficulty connected with differences of level, and a constant seaward current, I am not able to say; the only evidence that appears to be adduced in support of this view appears to be the presence of salt water fish, and the death of fresh water vegetation at times when the sea is supposed to have encroached upon the river. All this may, however, be readily accounted for by the gradual concentration of the river waters, and by the fact that during exceptionally dry years the latter are supplied mainly by infiltration, and not by catchment. In brief, if the sea is responsible for the saltiness of the river waters, the proportions of the salts present should approximate those of the sea. Whilst I am free from pretending that an analysis of the drainage waters standing alone is proof sufficient of the inaccuracy of a popular belief, I am inclined to the view that all natural laws are against it, and hope during the course of the present season to have an opportunity of definitely disproving it.

Is salt, the presence of which is undeniable, going to prove an insuperable difficulty in the irrigation of the swamps? To this question I have no hesitation in advancing an emphatic negative. Let us consider it first in its relations to the higher and cultivated levels, and then to the lower and at present sterile levels.

Seeds, in the process of germination, are peculiarly sensitive to the action of salt; and whilst I am not prepared to deny that a succession of low river years might not tend to accumulate salt in the surface layers of certain patches unduly exposed to soil evaporation, even on the higher levels, to the extent of hindering germination, I am firmly convinced that, given careful management, there is no likelihood of the soil becoming at any time so impregnated as to refuse to carry profitably thickly sown herbaceous plants. The salts present are exceedingly soluble, and, unlike sodium carbonate, exercise no injurious action on the physical condition of the soil. Under ordinary conditions, the natural drainage of the irrigation waters towards the back of the swamps should prove sufficient to carry with it the bulk of the saline matters introduced. With the moisture that is retained by the soil some portion of the salt must of course remain; part of it will be taken up by plants; and what remains will at later periods be largely removed by irrigation waters drawn from a high or flooded river, comparatively poor in soluble salts. And further, should the salt at any time accidentally accumulate to an inconvenient degree, there can be no special difficulty in removing it by flooding with high river water. Sodium chloride is extremely soluble, and will wash out readily; the same may generally be said of magnesium sulphate; the latter may further be rendered innocuous by an average dressing of lime that will convert it into magnesium carbonate.

These facts, notwithstanding our climatic conditions, are such that no more the irrigationist on the swamps than his less favoured brother on higher levels can afford to overlook the disastrous effect of unchecked soil evaporation; if there is one maxim that both should bear in mind it is summed up in four words—KEEP THE SOIL GREEN. To whatever use it may be put, whether it is grown for grain, root, fodder, or even green manure, let crop succeed crop, and the danger of the rise of the salt will be reduced to a minimum.

And as for the back swamp, whether it can ever be profitably reclaimed, is a matter that those on the spot are in a better position to judge than I. Flooding with fresh water and leading the drainage waters back into the river will certainly remove the salt; whether this operation is likely to prove profitable is a question that I am hardly in a position to decide. In the meanwhile it may be noted that the denuded condition of this salt area, by exposing it to continued and unrestricted evaporation must only serve to intensify its barrenness. It may be suggested as a feasible project that deep drains be opened out along the contour of the lowest level; that the salt area around be broken up to a good depth, and dressed with lime at the rate of one ton to the acre; the surface subsequently harrowed and flooded more or less with water at high river time. The water should be allowed to sink through the soil, where it would become charged with the soluble saline matters, and drain off slowly into the trenches opened out for that purpose; thence the salt laden water could be pumped into the river. It is probable that if as soon as the soil has become sufficiently drained and before surface evaporation can have had time to come much into action, it is probable that if the surface is immediately sown to mangolds, or some other salt-loving plant, that fairly successful growth will ensue. The principles underlying the whole question are fairly plain: it remains, however, for those immediately concerned to find out the most economic methods of application.

And thus comes to a close a somewhat long discussion on the Murray swamps: my data have not been numerous, but I trust that some of the facts that have been elucidated will prove of some practical value to those who may be concerned with them. If they can secure Messrs. Morphett some few imitators I shall feel amply satisfied.

Here I will take the opportunity to state my conviction that a systematic examination of the Murray waters would lead to results of the highest importance to the future development of the Murray banks. Unfortunately we have as yet no Departmental Laboratory in which this work could be done. By special arrangement with the School of Mines it could at present be carried out at a cost of £100 to £120; this would cover regular monthly examination of the waters from three or four stations, say at Renmark, Morgan, and Murray Bridge. The sum involved is, however, beyond what could legitimately be spent on one special line of work out of our general Parliamentary vote, and as without the sinews of war, nothing can be done, I trust some other means of securing this sum may soon be open to us.

NOTES FOR FACTORY MANAGERS.

CHEDDAR CHEESEMAKING.

By G. S. Thomson, F.R.S.E., Government Dairy Instructor.

The quality of cheese produced in South Australia bears evidence of the skill and knowledge possessed by our factory managers. The old-time "secrets" have vanished, when the student used to be sworn in to keep the mysterious knowledge under a heavy penalty. To-day the doors of our factories are open to the visitor, and every process in the science and practice of cheesemaking is conducted without a shadow of concealment, while the sensible manager does not scruple to point out the delicate features which govern the quality of the product. Well informed as we are, however, there is much to be learned in the unwelcome changes which are ever occurring in the preparation of the article. It is with a view to illustrate some of these difficulties that I have chosen the above subject, and experience gained in this State and other countries affords me a good opportunity to make the reading of interest and profit to our managers. First, let us consider the dangers the quality of cheese is exposed to by influences not immediately under the manager's control.

Colouring.

For example, take the evil consequences which follow the uses of hurtful colouring matter. It is not uncommon to recognise the flavour of the compound in the ripened cheese, and I would impress upon managers the necessity for adopting a low standard of colouring in the factories throughout the State. Much improvement has been effected in this direction of recent years, but an equality is desirable in all consignments and at all times. When purchasing annatto be satisfied that the best article in the market is procured and the quality fresh.

RENNET.

I would draw attention to the great importance of being equipped with a supply of the finest rennet. Marked instances of injury to the quality of cheese have come before my notice quite recently, and in one case the manager was adding from 5 to 7 oz. of the liquid to bring about coagulation of 100 gallons of milk in from 50 to 110 minutes. I investigated the case, and had conclusive evidence of the very inferior condition of the rennet. I do not condemn the brands used in South Australia, but I emphatically oppose the sale of old and highly dangerous mixtures. Think of what follows the application of this unwholesome substance. We get feeble coagulation in the milk, accompanied by an open body, with cream collected on the layers of the coagulum. Difficulty and failure in cutting are experienced, causing heavy losses of the solids of the milk. Ample evidence of this serious weakness is manifested by the glittering of fat in the milky whey. Some may think that time in thickening would suffice to reach the firm stage for cutting, but the energy of the weak ferment is soon exerted. The controlling agent, temperature, is decreasing as time goes on, thus depriving the rennet of an able assistant, while the acid in the slow milk affords but little help. We further suffer in irregular cooking of a soft, bodyless curd, and in this season of the year, and when starters are not used, development of acid is grievously slow, ending in either a sweet, sour, or pasty product, poor in butter fat, and consequently of little value.

One only needs to engage in the manufacture of cheese with weak and sickly rennet to find out the trying difficulties occasioned by its action, and I have formed the opinion that the preservatives which are contained in the rennet are responsible to some extent for the excessive slowness of the lactic acid in the curd. This belief would be more in evidence where under-ripened milk was under treatment. It is, perhaps, not known that commercial rennet contains such preservatives as boracic, salicylic, and benzoic acids. These chemical substances are fatal to a proportion of the active ferments. Sound rennet is free from any disagreeable smell, is clear, and of good strength, but weakens fast with age, one year being sufficient to reduce its action by 30 per cent. Rennet must be kept in darkness, as light acts very injuriously. The powdered product is gaining in favour in some countries, and it has undoubtedly a great advantage over the liquid supply by its greater strength and purity. When inferior quality of rennet is suspected, managers would do well to forward a small quantity for examination purposes, which will be conducted free of charge.

TEMPERATURE OF RENNETING.

There is a diversity of opinion among cheesemakers as to the temperature of milk at the time of adding the rennet. Some contend that winter milk should be coagulated at a lower temperature and more rennet added. As the season advances, with an increase of butter fat in the milk, a higher temperature is required, and less rennet. My experience leads me to suggest both a higher temperature and more rennet at this season of the year, and throughout the cold winter months. There is an evident weakness in the milk, that necessitates a firmer coagulum to hold the fats together. If danger is incurred, care in scalding and handling the curd will overcome all difficulties in the treatment of sound and well-ripened milk. It is at this stage that many grave mistakes are committed, and greater efforts should be devoted to bring about coagulation in a given time, without permitting an excess of acid in the milk, or an overdose of rennet and a very high temperature. I find that, with all things normal, the best results in the quality of the cheese are obtained when coagulation takes from 30 to 40 minutes to produce a firm body for the knives.

CONDITION OF MILK.

I will refer to the condition of the milk, which is a great factor in successful cheesemaking. At the present time very slow acidity is frequently experienced, and it is a matter for immediate attention to ripen the milk before renneting. This can be done by selecting samples of the best milk in sterilized jars and keeping them at a temperature of 75 deg. F. until coagulated into a firm curd. Select the starter that is possessed of the best flavour, and is free from holes, and add to the milk in sufficient quantity to bring about ripeness in a given time. This will be ascertained by the acid test. Fresh starters can be prepared by inoculating pasteurized skim milk with a quantity of the approved sample. Great care is necessary in carrying out this work, as contamination of the starter would lead to serious results in the cheese. More experiments will be conducted on these lines, and managers notified.

SCALDING CURD.

Begin the scald immediately after hand stirring, which takes from five to ten minutes; raise the temperature steadily, reaching 99 deg. in 50 minutes or one hour. This heat is sufficient when the milk is not rich, but in the summer weather a temperature of over 100 deg. is required to expel the moisture. With gradual cooking you have the three agents working to the greatest advantage of curd and cheese, viz., rennet, heat, and acid. Irregularity in scalding is ruinous to the properties of the cheese, and the reason of some of our cheeses going off in flavour after cutting is due to want of a steady acid development throughout the process of making.

SETTLING IN THE WHEY.

As soon as the stirring has ceased allow the curd to settle, and do not omit to cover the vat with a cloth, to maintain temperature. With proper management up to this stage the curd will begin to bear evidence of the presence of acid by its increasing elasticity, and by the end of 40 minutes to one hour threads of one-eighth to a quarter of an inch will be drawn on the hot iron.

DRAWING OFF THE WHEY.

At this juncture the whey should be removed without a moment's delay, the most delicate point in cheesemaking having been reached. Everything should be in readiness for the reception of the curd in the cooler, and nothing allowed to interfere with the manager's strict attention to duty. Drain speedily, as the sooner the curd is in the cooler the better; and here I would strongly advise the purchase of large siphons, as the small ones in the factories at present are decidedly injurious to cheesemaking. As the curd is smartly delivered into the cooler stirring must be done at once, to assist escape of the moisture surrounding the cubes. Remember, it is only this moisture that drains; all the stirring possible would prove ineffectual in drying the internal parts of the curd. From five to seven minutes is sufficient to stir, and during that time no cold current of air must be admitted over the curd, more especially during the cold months of the year. Should the temperature be allowed to fall below 94 deg. F., the development of acid would be checked and an excess of moisture retained in the matted curd.

MATTING.

Pile the curd neatly to one end of the cooler, and cover with cloths and boards, having weights. At the end of 20 minutes uncover and cut into squares, afterwards placing the blocks two deep, with the end squares to the inside. At the expiry of 15 minutes turn again, putting the top ones below and the corner ones in the centre, making the squares three deep. Change again at the end of 10 minutes. The weights are generally removed after 35 minutes from matting, but the covers must be kept in use until the curd is ready for milling. By adopting the above procedure whey pools are prevented, and the curd receives similar treatment throughout the piling. It must be borne in mind that piling too high favours an escape of fat, and causes the curd to be unduly soft. For milling do not be guided altogether by the feel and attractive tear of the curd, but rely more on the iron test and smell. When three-quarters of an inch of acid has developed it is time to mill. The well-matured curd has now the desired characteristics, being flaky, silky to touch, and possessing a sweet, pleasant smell. Mill slowly, giving the machine time to cut the curd into regular pieces. Stir for a few minutes and salt. Only the best quality of salt must be used, having a grain not so fine as required for buttermaking. The extent of salting depends upon the richness of the milk, amount of moisture in the curd, and acidity and flavour, rich milk, moist, and off-flavoured curd requiring more salt. The quantity varies from 1¾ per cent. to 2½ per cent.

Pressing.

Before pressing, the salt must be thoroughly stirred into the body of the curd, then piled in a heap for 10 minutes, and stirred again. In filling the hoops care must be taken to have more curd in the middle, otherwise the whey will not be forced out and the centre of the cheese properly pressed. Pressing must be done gently at the beginning and gradually increased to full weight at night. Pressing for a couple of days gives the best results.

What has been given in this paper is only a brief account of the general course I would recommend managers to pursue, at the same time recognising that it is impossible to adhere to these points at all times, alterations being imperative to cope with the peculiar changes which occur throughout the manufacture of cheese.

Faults.

I will conclude the first part of my article by detailing the chief faults, with their causes and remedies, and would urge cheesemakers to closely study these lines. They will be given as near as possible in the order of cheese production.

Tainted Cheese.—Impurities in the milk are invariably the foundation of most taints. Colostrum, or new milk, breeds bad flavours. The use of a starter prepared as suggested and added to tainted milk when low in acidity, will prove beneficial.

Discolouration and bleaching are caused by injurious bacteria acting upon the colouring matter in the cheese. Excess of colouring and inferior quality are strongly condemned on account of the above danger. Moist curd and insufficient acid favour the fault, and bleaching follows excess of acid in curd before the whey is drawn. Curd piled too long in the cooler without turning has a similar effect. Careless pressing must be avoided.

Milky whey is a fault in the making that it will be well to explain thoroughly. Sweet or under-ripened milk causes slow and imperfect coagulation and losses of fat and total solids. Remedy.—Ripen sufficiently before renneting. The addition of preservatives to milk retards acidity and injures the coagulum with similar results. Watered milk, being more difficult to thicken, gives a ready escape to the casein and fat. Bad stirring of milk after renneting and a quick falling temperature damage coagulation. As already pointed out inferior rennet is exceedingly hurtful. Cutting before the curd is sufficiently firm leaves the cubes soft, liberates the fat, and checks acidity. Reckless cutting seriously injures the constitution of the curd and whitens the whey. The use of the rake too early breaks up the tender cubes. Delay in beginning to scald after cutting entails loss of solids. Rapid scalding to a high temperature drives out the fat. I might point out that fine cutting should be done when the milk is rich with a view to a more thorough removal of the moisture, also in the treatment of fast milk.

Weak, pasty cheese follows quick scalding of rich milk, locking in the moisture. Remedy.—Cut finer and scald steadily to 101 or 102 degrees F. In the autumn and cold months of the year pasty cheese is often caused by the curd getting cold in the vat or cooler, producing a check on the acid and preventing an escape of the moisture. Salt sound curd in cold weather at a temperature not below 82 degrees F. A weak cheese when paled gives a swollen plug which cannot be replaced.

Open Bodied Weak Cheese.—Setting too soon in whey, making a soft and tender curd. The feel of the curd at "whey running" demonstrates what the body of the cheese is likely to be. A sour cheese may follow the proper degree of acidity in the vat, but the condition of the curd would show a want of elasticity and firmness. Piling the curd too high encourages fast ripening and a weak body in the product.

Holey Cheese.—In the sweet cheese the presence of round holes points to unripened milk and salting too early. Rugged holes may result from an irregular distribution of moisture and uneven temperature in the cooler bringing on defective acidity. A sweet cheese is difficult to press, as the condition of the curd resists the binding influences of the screw. Heavy pressure is desirable, and with that the cheeses will often heave in the curing room. To safeguard as much as possible do not press at a high temperature and be careful in its gradual application to full pressure at the end of three hours. Particularly note that a sweet cheese frequently finds an answer in drawing the whey too sweet and in salting in advance of the acidity.

Badly Shaped Cheese.—Cheeses that are found swollen on the sides, rounded at the edges, and heaving on top, are weak and open in body. Pressing at a temperature above 88 degrees F. will be sufficient to cause vapour to generate in the body of the cheese, and when the pressure is removed the weakness is soon noticeable. Excessive heat in ripening room acts injuriously on the shape of the cheese.

Bleeding or Leaking.—When moisture is noticed running from the cheese in the ripening room it indicates either over-ripe milk or too much acid in the curd. Instances of the latter have come before my notice quite recently. Acid milk or curd also makes cheese of a dry and mealy texture, poor in butter fat. What is known as acid-cut cheese is a result of the same mistakes.

The appearance of butter-fat deposits in cheese arises from scalding at a high temperature and piling the curd too deep in the cooler. Overstirring, after milling and salting, when the curd is too hot, is also hurtful.

Cheese poor in fat may result from poor milk, defective coagulation, and careless cutting. Experiments in scalding at high temperatures proved the extent of the loss of fat in the whey and damage to texture of curd. The chief causes are—Piling too deep in company with pressure and salting the curd at a high temperature. I have already recommended salting at nothing below 82 degrees F.; do not exceed 86 degrees F. Heavy pressing at too high a temperature crushes the texture of the curd and drives the fat out of the hoops on to the base of the press.

Dry, Crumbly Cheese.—Too much rennet, high temperatures at coagulation, excess of acid and salt, cold curd, and insufficient pressing. When the curd has been allowed to get cold the good influences of the press are much reduced.

Cracking and Mouldy Cheese.—Over acidity will cause cracks on the outside. Bathing the newly pressed cheese in hot water at a temperature of 135 degrees F. for one minute will toughen the skin. White moulds and mites indicate too much whey; blue moulds show a healthier product. Where annoyance is caused by the fungus have the curing room swept out at a convenient time, not missing a single bit of structure, scrub with a cheap disinfecting mixture, burn sulphur, and finally spray with a 10 per cent. solution of formalin. Ventilate thoroughly and admit more light. Sponge the mouldy cheeses with hot water containing a little ammonia. Attend to turning daily to allow uniform evaporation, and place the cheese so as not to touch each other. Red spots are sometimes the result of rough handling.

(To be continued.)

* * *

ROSEWORTHY AGRICULTURAL COLLEGE NOTES.

FARM.

By J. D. Towar, Professor of Agriculture

Abundant and favourable rains have brought on splendid green feed in all the fields. All the live stock are in excellent condition, and the 265 store sheep bought late in April are doing well. The cows have discarded silage for the fresh green feed, leaving us with one silo full of good feed, which may be useful later on. The weather has been especially fine for lambing, and a most successful season for the breeding ewes is progressing. Of the 80 lambs which have already arrived not one has yet died. The Dorset ewes and ewes bred to Dorset rams are the first to lamb, and a good number of them are bearing twins.

The Shropshire ram which has been used for the past two seasons died of hydatids early in the month. Mr. S. S. Ralli, of Werocata, has kindly offered to furnish us with another.

The rape sown late in February and early March is still making good growth, and is now being pastured off by the cows and sheep. Since the cows have been turned in to the rape there has been a marked increase in the yield of milk.

Seeding has progressed favourably. Dahlitz, the Island, and Flett's fields are finished, and a good start has already been made in No. 8. When all is finished there will be a total of about 560 acres. Dahlitz (43 acres) has been all sown to Cape barley; 1½ bushels per acre, and about 1¼ cwt. of mineral super. Seed sown April 14-18. Splendid germination, and early growth. The Island (187 acres), 49 acres to oats, 12 acres oats and wheat, 10 acres wheat cross-drilled, and the balance to late wheats for hay; about 1¼ cwt. mineral super per acre. Seed sown April 20-May 6. Germination of oats was somewhat faulty; wheat germinated well, and is growing perfectly; cross-drilled wheat exceptionally fine. Flett's field (145 acres), sown to College Selection and King's Early wheats; 1½ cwt. mineral super per acre. Seed sown from May 7-16. It is expected to harvest this crop for grain. No. 8 (175 acres)—A small portion of this field will be used for lucerne, rape, vetches, and other experimental crops; and the remainder, about 160 acres, will be devoted to experiments outlined below.

Fertiliser Experiments with Wheat: Plots—2 Acres.

EXPERIMENT A, PHOSPHATES.—King's Wheat.

Plot. Crop to be cut for grain.

1. No manure.
2. 56 lb. mineral super (36-38 per cent.).
3. 112 lb. " "
4. 168 lb. " "
5. No manure.
6. 224 lb. mineral super (36-38 per cent.)
7. 280 lb. " "
8. 336 lb. " "
9. No manure.

EXPERIMENT B, PHOSPHATES.—King's wheat, plots 10-18 inclusive. Duplication of above. The crop to be cut for hay.

EXPERIMENT C, VARIOUS MANURES.

Plot. Crop to be cut for grain.

19. No manure.
20. Complete fertiliser.
21. Home-mixed fertiliser.
22. Mineral super.
23. No manure.
24. Guano phosphate.
25. Bonedust.
26. Thomas phosphate.
27. No manure.
28, 29. Mineral supers donated for trial.

EXPERIMENT D, VARIOUS MANURES.—Duplication of above. The crop to be cut for hay.

EXPERIMENT E, SOIL TESTS.—Plots ¼ acre.

King's wheat.

Plot. Manure applied per acre.

1. No manure.
2. 56 lb. nitrate of soda.
3. 56 lb. sulphate of ammonia.
4. 168 lb. mineral super.
5. 56 lb. muriate of potash.
6. No manure.
7. 56 lb. nitrate of soda and 168 lb. mineral super.
8. 56 lb. sulphate of ammonia and 168 lb. mineral super.
9. 56 lb. muriate of potash and 168 lb. mineral super.
10. 56 lb. muriate of potash and 56 lb. nitrate of soda.
11. 56 lb. muriate of potash and 56 lb. sulphate of ammonia.
12. No manure.
13. 56 lb. nitrate of soda, 168 lb. mineral super, and 56 lb. muriate of potash.
14. Complete fertiliser.
15. 112 lb. nitrate of soda and 112 lb. mineral super.
16. 56 lb. nitrate of soda and 224 lb. mineral super.
17. 224 lb. mineral super.
18. No manure.

VARIETY TESTS FOR WHEAT.—The varieties grown last year in field plots, varieties grown in small cultivation plots from last year's experiment, and several new varieties from this State, Russia, and the United States will be tested alongside one another.

PREVENTION OF SMUT OF BARLEY.

A quantity of badly smutted barley was obtained, divided into four equal parts, and treated as follows:—

No. 1. "Pickled" in 20 per cent. bluestone solution.

No. 2. Treated with double strength formalin solution, i.e., 1 lb. formalin to 25 gals. of water.

No. 3. Treated to a patent treatment, presented by Messrs. E. & W. Hackett, Adelaide.

No. 4. Untreated.

A mistake was made in not giving the untreated part a plunge in pure water, in order to secure the same physical character to the grain as given the other three, as the seed ran through the drill more rapidly, and thus covered a tenth less ground than the treated seeds. The seed on every plot has germinated uniformly, although at present the untreated plot shows the strongest growth, the patent treatment the weakest, and plots of copper sulphate and formalin are alike and midway between the other two.

A small area will be devoted to the trial of some smut-resisting wheats, in co-operation with Mr. W. Farrer, of New South Wales.

Field No. 8.—General crop for grain and hay and some cultivation experiments.

SUNDRY EXPERIMENTS.

(a) Rolling ahead of the drill.
(b) Broadcast vs. drilling.
(c) Harrowing after wheat is up.
(d) Pasturing wheat with sheep, if the occasion recommends it.
(e) Cross-drilling for hay.
(f) Early and late wheats mixed for hay.
(g) Wheat and oats mixed for hay.
(h) Deep and shallow drilling.

The aim will be to save grain, hay, straw, and ensilage of wheat, barley, and oats from the harvested crop to use in future feeding experiments.

EXPERIMENTAL VINEYARD.

By H. E. Laffer, Superintendent of Vineyard.

The splendid autumn rains which have fallen enabled the work in the vineyard to be pushed on rapidly. The ground received a good soaking, the weeds consequently coming away very quickly. The sheep from the farm were turned into the vines for a few days, making short work of the abundant growth of weeds. This greatly facilitated the work of the ploughs, and now most of the heaviest land is turned over. This is in strong contrast to the previous season, when at this time the teams had not been started on account of the lack of moisture in the soil. The vines being as yet unpruned, the final furrow cannot be taken off, but should we be favoured with much wet weather at a later date the teams can be kept going on the sandhills and limestone patches.

The vines are fast shedding their foliage, and on the more advanced plots pruning has been started. This operation has to be started early, for at first it must necessarily be very slow while getting the students into practice.

Several acres of new trellis have been erected during the last month, the whole block of vines extending from the College to the cellars now being complete. The last block, comprising eighteen rows of Malbec, has been put on to the Cazenave Cordon trellis, minus the top wire. The second wire is raised 6 in., and we think that this will be sufficient to tie the young growth to, for the vines are not likely to make excessive growth in these regions. By this means the cost of the trellis is reduced considerably.

Early in May a ton of apples was made into cider. The product has been fermenting slowly ever since, and is now almost finished.

During the last month some low temperatures have been recorded, but so far no frosts have occurred. The rainfall up to date is between 6 and 7 in.

THE USE OF FERTILISERS IN SOUTH AUSTRALIA.

By W. L Summers, Inspector of Fertilisers.

That the use of phosphatic fertilisers for cereal crops is distinctly profitable in South Australia is evidenced by the marked increase shown each year in the tonnage purchased by our farmers. The practice of applying commercial manures to our wheat crops may be said to date from 1896, prior to which date the area treated was very limited. In 1896 not more than about 700 tons of manure were imported into South Australia. The following year saw a considerable extension in the quantity used, and the figures herewith indicate how rapid has been the development of the practice, which, in conjunction with early fallowing, has practically been the salvation of the South Australian wheatgrower.

In estimating the tonnage used for the cereal crop every care has been taken to state it somewhat under what my records indicate the actual amount to be. Throughout the season I keep records of every shipment of manure that arrives, and the principal local manufacturers have courteously furnished me in confidence with particulars of their output to enable me to publish figures which can be accepted as reliable. The thanks of the department are due to these gentlemen, as well as to the importing firms who afford me every facility in gathering these statistics.

The following are my estimates of the quantity of fertilisers used each year since 1897, when 3,000 tons were used:—1898, 12,000 tons; 1899, 16,500 tons; 1900, 24,600 tons; 1901, 31,400 tons; 1902, 37,500 tons; 1903, 44,500 tons.

Although we have no means of ascertaining with any degree of certainty what area of land is manured each season, there is very little doubt that, taking it right through, the average dressing applied is less than 100 lb. per acre—probably 84 lb. would be a fair estimate. If we accept the former figure, the 44,500 tons will suffice for, in round numbers, a million acres of land; at 84 lb. per acre we have 1,186,640 acres of the 1903 cereal crop growing on land that has been manured.

What does this represent to South Australia? We have no means of ascertaining how much was paid for railway freight on the manure, nor how many bushels extra of wheat are produced and carried over the railways as the result of the use of these fertilisers. We cannot tell how much extra labour has been employed, nor how the extra circulation of money has indirectly benefited the State; but we can form a fair conclusion on the direct outlay by the farmers. First, we have 44,500 tons, which cost the farmers on trucks or coasting vessel at the place of import or manufacture about £189,000. Second, comes the cost of carriage by boat or rail, which at the very low average of 5/ per ton will add £11,000 to the above, making the direct cost £200,000. We must also take into consideration the outlay for seed and fertiliser drills. During the past five years these drills have simply been pouring into South Australia, and it is a matter for wonder where they all do go. One would naturally expect, as the drills last for a number of years, that the demand would lessen; but apparently it has not fallen off to any great extent. I believe I am within the mark in saying that our farmers spent fully £30,000 this season for new drills.

During the year I have drawn 68 samples of fertilisers for analysis. Of these 35 were imported brands, and the balance of local manufacture. The results of the analyses were, on the whole, very satisfactory. Three brands only were found deficient to any marked extent; other samples of two of these showed above the guarantee. In nearly all cases the analyses were above the guarantee of the vendor. All results of analyses have been published in this Journal for the information of the purchasers.

THE SOLUBILITY OF THOMAS PHOSPHATE.

By W. L Summers, Inspector of Fertilisers.

Although Thomas phosphate is not largely used in South Australia, experience having demonstrated that it is not a suitable form in which to apply phosphate to the greater portion of our wheatgrowing areas, the question of the availability of the phosphoric acid contained therein is of importance to the farmers who use it. A few years ago we imported considerable quantities of Thomas phosphate of high grade, but latterly the amount has not averaged more than about 1,000 tons per annum. Owing to the strong demand for this fertiliser in Europe, which in the producing countries has been sold at comparatively cheap rates, the supply of high-grade material has fallen off to such an extent that it is now apparently a difficult matter to secure any quantity containing 17 per cent. to 20 per cent. phosphoric acid, the grade that was formerly imported, and most of what now comes here contains only from 13 per cent. to 15 per cent.

Apart from the total quantity of phosphoric acid in this phosphate, there are two very important points which govern its value as a fertiliser, viz., fineness of grinding and solubility of the phosphoric acid, as tested by means of a solution of citrate of ammonia. Professor Wagner, probably the greatest authority on Thomas phosphate, as a result of numerous experiments, states that fineness of grinding has a marked effect on the solubility of the fertiliser, and the finer the grinding the greater the solubility. In actual experiments he found the finely ground phosphate four times as effective as the same quality ground to a coarse powder. He and other authorities agree that, with the best quality, about three-fourths of the total phosphoric acid in Thomas phosphate should be soluble in the citrate of ammonia solution.

During the past few years I have had a number of analyses made of the different brands of Thomas phosphate imported into South Australia, with a view to ascertaining the percentage of solubility. The following are the results:—

Sample			per cent.		per cent.		per cent.
Sample	A	Phosphoric Acid Sol. in Citrate of Ammonia	14·3	Phosphoric Acid Soluble in strong Acid	2·5	Total Phosphoric Acid	16·8
,,	B	,,	12·18	,,	6·69	,,	18·87
,,	C	,,	11·82	,,	5·95	,,	17·77
,,	D	,,	14·0	,,	2·9	,,	16·90
,,	E	,,	11·0	,,	1·91	,,	12·91
,,	F	,,	10·0	,,	3·51	,,	13·51
,,	G	,,	3·7	,,	9·5	,,	13·20
,,	H	,,	10·81	,,	2·7	,,	13·51

As the tests extend over a period of three years, and the vendors have not in any case guaranteed the percentage of citrate soluble phosphoric acid, it would hardly be fair at this juncture to publish the names of the brands.

The above table is of considerable interest. Comparing A, B, and D, it will be seen that, while B contains highest total, A and B are certainly of greater value to the farmer. It will also be noted that, although on the total (12.91 per cent) sample E would be classed as a low-grade Thomas phosphate, it is nearly equal in value to B and C. Similarly, E, F, G, and H may also be compared with one another; these are all sold under a guarantee of 13 per cent. to 15 per cent. of phosphoric acid; yet, according to these analyses, sample G represents a very inferior article compared with the other three. It is probably sold at about the same price, yet contains only a little more than one-third as much available phosphoric acid as the others.

In the past Thomas phosphate has always been sold on a guarantee of total phosphoric acid, irrespective of its form. The foregoing figures would, however, indicate that, in his own interests, every buyer should insist on the citrate soluble content being guaranteed, as all authorities agree that any phosphoric acid which cannot be dissolved in the citrate solution must undergo certain changes in the soil before it can be taken up by the plants. These changes, except in respect to materials that readily decompose in the soil, are generally of a very slow character.

LOSSES OF SHEEP FROM EATING STINKWORT.

There seems to be but little reason to doubt that the stinkwort when in flower is fatal to ewes heavy in lamb. Every season in April and May a number of reports are received of losses among breeding ewes grazing in paddocks which contain stinkwort, and, as deaths almost invariably cease when the stock are removed to land free from the weed, there is at least some evidence that points to stinkwort as the cause of the trouble.

This season losses appear to have been heavier than usual; possibly the summer rains caused a greater spread and development of the weed. In nearly every instance it is the in-lamb ewes that have succumbed, though there have been losses amongst young sheep. Farmers would do well therefore to remove the sheep from the stinkwort infested paddocks; in fact, breeding ewes should on no account be allowed to remain in such paddocks after the stinkwort has run up to flower. Every effort should also be made to prevent the weed from spreading.

Mr. C. J. Valentine (Chief Inspector of Stock) strongly recommends giving the following as a drench to each sheep as soon as any are seen to be affected, viz.:—4 oz. Epsom salts, 4 oz. coarse sugar or molasses, and ¼ oz. ground ginger, in half a pint of water or linseed tea. The drench can be prepared in large quantities; for 200 sheep take 50 lb. salts, 50 lb. sugar or molasses, 3⅛ lb. ginger, and 12½ gallons of water.

POULTRY NOTES.

By D. F. Laurie.

Disease.

A great many cases of disease have been reported to me of late, and I am constantly in receipt of letters asking advice. I also hear that Victorian breeders are similarly situated, and several severe losses are recorded. Much disease is caused through the soil becoming saturated with the excreta, which, in many cases, contains the germs, or organisms which cause the trouble. It is highly probable that disease organisms may be present in a fowl without showing any signs of activity. The time may not be ripe—the general health of the bird, the season, food, environment, and other things may not be favourable to their development. In due course they are voided, and are lodged in the excrement-saturated soil, where they remain dormant until such time as change of seasons offers an opportunity for their active attack on the birds. Then, if they obtain a hold, they increase both in numbers and virulence, and the disease, at first slight, soon assumes a serious form. There is little doubt that most of these organisms become attenuated during the period of inactivity in the soil. I think there are good reasons for believing that organisms lodged in excreta-saturated soils retain their vigour to a greater extent than if in a dry soil of poor quality. At the same time I am quite satisfied that many germs are conveyed from place to place by the wind, particularly with dust from an infected area. It may be taken for granted that any coop or house which has contained diseased birds is likely to be a source of contagion or infection. I do not wish to pose as an alarmist in any way.

In these articles I have endeavoured to place many years' experience at the service of readers. I well remember, in days gone by, the subject of diseases had never been thoroughly investigated. As a matter of fact, the knowledge we have at the present day is due entirely to the enormous strides in science within comparatively recent times. Inoculation is a sort of lodestone to the medical profession at the present time, and many are probably not aware that the great Louis Pasteur practically modernized the old ideas on inoculation by means of his experiments in 1880 with the dread disease chicken cholera. He followed the ideas arrived at by Tyndal, who was working on the same lines, and was probably assisted in his researches by Lister's marvels in surgery, and particularly by the well-known successes of Jenner in inoculation. More recently many investigators have shown poultry breeders that the actual causes are in many cases organisms whose presence was quite unsuspected. For instance, the diarrhoea common in poultry was generally and solely ascribed to change of water and injudicious feeding. In the majority of cases the real cause is found in the presence of a micro-organism known as the streptococcus. Doubtless change of food, water, and environment may have so affected the bird as to pave the way for an active crusade by the hitherto dormant germ. Or it may be that the change affected a bird to an extent which offered suitable conditions to organisms located in the food, soil, or water. However, the main point of interest, and the chief lesson we learn, may be summed up in the fact that we must breed for vigour and constitution on the one hand, and on the other pay more attention to the question of hygiene. Where the birds congregate will be found a probable source of danger. Dirty, stagnant water is generally a splendid breeding ground for many noxious organisms, and must not be permitted to exist. We constantly hear of soil becoming sick—that is the common explanation given in accounting for the prevalence of disease. It is due, as stated, to the presence of organisms. This is no theoretical assertion; it can be proved at any time by even a beginner in bacteriology if armed with a good microscope and a chart guide of some of the principal organisms in question.

As a rule sunlight and frequent aeration are fatal to disease germs, but it is better to go further and take measures for their destruction. I do not assume that organisms, bacteria, &c., are solely responsible for all disease. They are answerable for a great many. Poisonous exhalations will cause sickness, and it is a well-known fact that an accumulation of its own excreta is highly prejudicial to any bird or animal.

One or two correspondents have prefaced their accounts of disease by asking me to not to blame their want of attention to cleanliness, as they state they have followed my instructions in this respect. That does not alter the fact that the disease in question is due to neglect, either at that particular place at a time perhaps long previous, or at a place where perhaps the birds or a bird now in the flock was bred. The whole subject of diseases is interesting, and at the present stage no one is master of all the details. We adopt treatment—empirical no doubt—and await the true scientific explanation. Scientists are by no means at one on the question of heredity as regards diseases; but I think the time must come when heredity will be recognised, at least as far as predisposing to disease, to a much greater extent than the most recent writings of scientists would lead us to infer. When you come to consider that the microscopic germ cell contains all the elements and characteristics of the future bird, it must stand to reason that serious diseases affecting the parent must leave an indelible mark, however indistinct at first. In my long experience I have noted how certain diseases affect strains of birds. Knowing their pedigree, I have been forced to the conclusion that there was in many of these cases strong evidence in favour of the theory of hereditary defect, or at least susceptibility. For this reason I have long urged that birds apparently recovered from malignant forms of disease are unfit for the breeding pen, and I am glad to note that the more advanced writers in other countries have of late expressed the same opinion.

To summarize we may be sure that we must--

1. Breed from birds of known constitution.
2. Never breed from stock known to have been badly diseased.
3. Feed on sound food, and refrain from the injudicious use of condiments and forcing foods, which will disorganize the digestion, &c.
4. Keep the birds in well-ventilated houses, and attend scrupulously not only to the drinking water, but to the drinking vessels.
5. Renew the soil, and make free use of germicides and disinfectants on all saturated soil where the birds congregate.

GENERAL.

The high price of eggs must have been a pleasing circumstance to those who had plenty of active laying hens and pullets. Doubtless there has been a great diminution in the numbers of poultry, due to high price of butchers meat, hard times, and the price of poultry foods. This will probably cause a permanent increase in price, or at any rate a great shortage in eggs. However, I know of hundreds of cases where people have discarded the old mongrel in favour of a better class of bird, and the results cannot fail to be to the general advantage. The old barndoor, or mongrel fowl, will not build up a fine industry. The rapid advances made of late years are due entirely to improvement in breeds, and, of course, to a certain extent, methods.

I hope all readers will resolve not to let this season go by without a big effort to improve their poultry. Rest assured it pays better to keep a limited number of high-class, productive birds, or stock of any sort, in preference to a large mob of non-producers. In many cases half the birds keep the rest and pay all expenses and profit. If the unproductive half were eliminated the others would represent a profitable flock. This should be the key to the situation.

COUNCIL OF AGRICULTURE.

The monthly meeting of the Council of Agriculture was held in Adelaide on May 27, all the members but Messrs. B. Basedow, A. D. Bruce, and A. M. Dawkins being present.

Members approved of the formation of two new branches of the Agricultural Bureau, viz., at Wepowie, with Messrs. H. Gray, T. Gale, R. Gale, C. Halliday, T. Orrock, J. Orrock, J. Chrystal, E. C. Smith, and R. Hanna as members; and at Morchard, with Messrs. Toop, McDougall, Longbottom, Scriven, Forbes, Brown, Piggott, Kupke, Kitto, Graham, Dawson, McKenzie, and Kummnick.

The following gentlemen were approved as members of the undermentioned branches:—Renmark, J. S. Higgins and J. A. Pyne; Mallala, A. H. Loller; Nantawarra, W. J. Dall; Kapunda, S. A. Harris and M. Byrne; Hawker, J. Iredell; Lucindale, N. Beaton; Onetree Hill, Phillips and S. Shillabeer; Whyte-Yarcowie, A. Canning; Mount Remarkable, E. Kaerger; Redhill, F. W. Button; Rhine Villa, J. E. Pannach; Caltowie, F. Royal; Willunga, W. H. Brown; Strathalbyn, J. T. Blake; Bute, T. Haldane; Tatiara, J. Bond; Wandearah, J. Wall; Golden Grove, N. J. Robertson.

In reply to request of the Council Professor Towar forwarded report on the question of agricultural education for women in America. He mentioned that a number of the Agricultural Colleges in America admit women, giving them much of the regular instruction in the same classrooms and laboratories, and even in the same classes as the young men. The system is co-educational in every way, the aim being to economize professional instruction, equipment, and buildings as much as possible. The women's course is known as the Domestic Science Course, and the arrangement of classes is such that horticulture, floriculture, chemistry, botany, physiology, entomology, bacteriology, mathematics, and literature are taught largely to the mixed classes; while the time occupied by the young men in veterinary science, live stock instruction, and practical agriculture is used by the young women in domestic science, sewing, music, and practical work in the science kitchen. A course of physical culture for the young women and military drill for the young men is usually given. The Domestic Science Course includes instruction in hygiene, elementary and therapeutic cookery, household economics, home nursing, values of foods, preservation of fruits and vegetables, daily management and furnishing of the house, household accounts, &c. Domestic Art includes plain sewing, dressmaking, and millinery. Horticulture and floriculture studies are usually optional to the young women; yet the courses are planned and the classes timed to permit them to take such portions of the work as they desire. The instruction covers methods of propagating plants; treatment of bulbs, annuals, and perennials; nursery, orchard, and garden treatment; handling, storing, and marketing fruits and vegetables; the use of manures; the application of insecticides and fungicides; study of varieties and their adaptation to soil and climate; pruning, grafting, and budding; management of hotbeds and glass houses, and the general work of forcing vegetables and flowering plants. The ordinary dairying courses at the Colleges are so planned that women may take it, and frequently the dairy classes contain a few women. Although this work is comparatively new among the Agricultural Colleges, yet in every institution where it is adopted it has met with unqualified success. The farmers' sons and daughters attend the same College, and the general result is regarded as wholesome and beneficial.

On the motion of Mr. Molineux it was decided to ask Professor Towar whether he thought it would be wise to make provision at Roseworthy College for agricultural instruction for women.

Mr. Miller stated that at the Annual Congress of the Agricultural Bureau last September Professor Towar advocated a series of short courses in agricultural instruction for the benefit of those who could not take the College course. Similar work had been started in Victoria, and promised well. The success attending Mr. Jeffrey's country wool-classing classes showed that if they had the opportunity the young men in the agricultural community would be glad to attend such classes. His idea was that the lectures should be given in suitable centres, and at the start, at any rate, should be confined to the branches of the subject most suitable to the particular locality. He moved that Professor Towar be asked to report on the practicability of establishing agricultural classes in country districts. The motion was carried unanimously.

The Minister forwarded request by Professor Perkins that a sum of money should be placed on the Estimates to enable the waters of the River Murray to be tested regularly throughout the year. The principal questions involved were:—(1) The nature of the salts present in the waters, and the period of the year when most abundant; (2) the most rational methods of using the waters to prevent the rise of salt on irrigated lands; (3) the fertilising values of the water and the silt introduced in the course of irrigation, and how to turn this to the best advantage. He considered the results of such work would be of immense value to South Australia. It was decided that the Council support the request for funds to carry out the tests outlined.

On the motion of Mr. Molineux it was decided to call the attention of the Commissioner of Crown Lands to the drifting of the sand hummocks between the Coorong and the sea, due largely to the careless and wanton destruction of the natural herbage, and to urge that, in view of the great importance of the matter, immediate action should be taken to prevent as far as possible further destruction of the vegetation on the sand hummocks.

On the motion of Mr. Krichauff it was resolved that the Council emphatically contradicts the statement from Eudunda Branch Bureau that hay from manured land was injurious to stock, as it had been fully proved that the application of phosphates to either hay or grass lands considerably improved the feed.

DEPARTMENTAL NOTES AND WORK.

During May, 1,780 cases of fruits and 88 parcels of plants were imported into South Australia. The former consisted chiefly of bananas, and the latter of fruit trees and roses. The trees are all unpacked and fumigated prior to admission being granted. About 25 cases of bananas were destroyed, owing to over-ripeness.

During the same period the inspectors issued export certificates for 6,422 cases of fruits, 41 parcels of plants, and 2,694 packages of vegetables. More than half of the fruit sent away consisted of apples, the remainder being made up of 11 kinds of locally grown fruits. This work has kept Inspectors Brown and Rowell busily engaged.

During May Mr. Quinn has visited orchards in the Wirrabara and Beetaloo Valley districts, and given advice on planting, and illustrations of pruning fruit trees and table grape vines. He has been particularly impressed with the fine quality of the apples, pears, and grapes grown at Wirrabara, and the possibilities for citrus culture also in selected positions along the Crystal Brook Creek, known as the Beetaloo Valley, were likewise noted. Having assumed control of the orchard and the delivery of the course of lectures in Fruit Culture, he started this work and visited the Agricultural College, Roseworthy, during each week. Several days have also been devoted each week to laying out the grounds around the main buildings. This is now practically completed.

In connection with the spraying tests for codlin moth, a final visit has been paid to the orchards treated at Houghton, Chain of Ponds, Forest Range, and Summertown. No permanent injury to the buds could be detected, where five sprayings with arsenite of lime had been given. The records of each plot are now to hand, and Mr. Quinn hopes to publish the results in detail in our next issue. A circular has been issued to all fruitgrowers known to possess 200 or more apple and pear trees. This has been done with a view to securing a consensus of opinion from those commercially interested in dealing with codlin moth. It is hoped the replies will prove of value in framing any future legislation.

The Inspector of Fertilisers has completed arrangements for the present season's experimental work in connection with the Department of Agriculture. The tests include—(a), different fertilisers for wheat crops in the drier districts; (b), the effect of relatively heavy dressings of potash on wheat crops; (c), the effect of nitrate of soda applied in the form of a top-dressing on cereal crop intended for hay; (d), the relative values of Thomas phosphate and so called substitutes for that fertiliser; (e), top-dressing pasture land. Analyses are also being made of samples of soil from what are generally known as salt patches with a view to ascertaining what substances injurious to plant growth these soils contain, and if possible, indicating treatment that will result in the growth of cereals or other crops. There are many hundreds of acres of land throughout the farming districts which formerly grew good crops of wheat, but which through the rise of salt, have been rendered barren, besides which there are large areas of salty soil which have never grown anything but samphire and other comparatively valueless vegetation, natural to such soil. The question of the profitable utilization of such soils is therefore of considerable importance.

During the month the Dairy Instructor (Mr. Thomson) paid an extended visit to Mount Gambier and Millicent to enquire into the causes of certain faults in cheese, which had been troubling a number of the managers recently. After careful enquiry, Mr. Thomson discovered the causes in most instances, and in this issue of The Journal appears the first instalment of an article dealing with the subject.

Mr. Quinn has made considerable progress in laying out the ground in front of the College buildings. The water is laid on there with 8 ¾-inch taps at places convenient to the entire area. The vegetable garden is looking well and will soon be supplying fresh vegetables for the College kitchen.

Mr. Thomson is instructing in dairying, having begun his practical work by teaching the third-year students the use of the Babcock milk tester.

Mr. Jeffrey is teaching wool classing earlier in the year than formerly. The College wool having been sent away, he has borrowed from the School of Mines a quantity for demonstration purposes.

The Professor of Agriculture has visited the Clare district during the month and delivered a lecture to the Branch Bureau of that place.

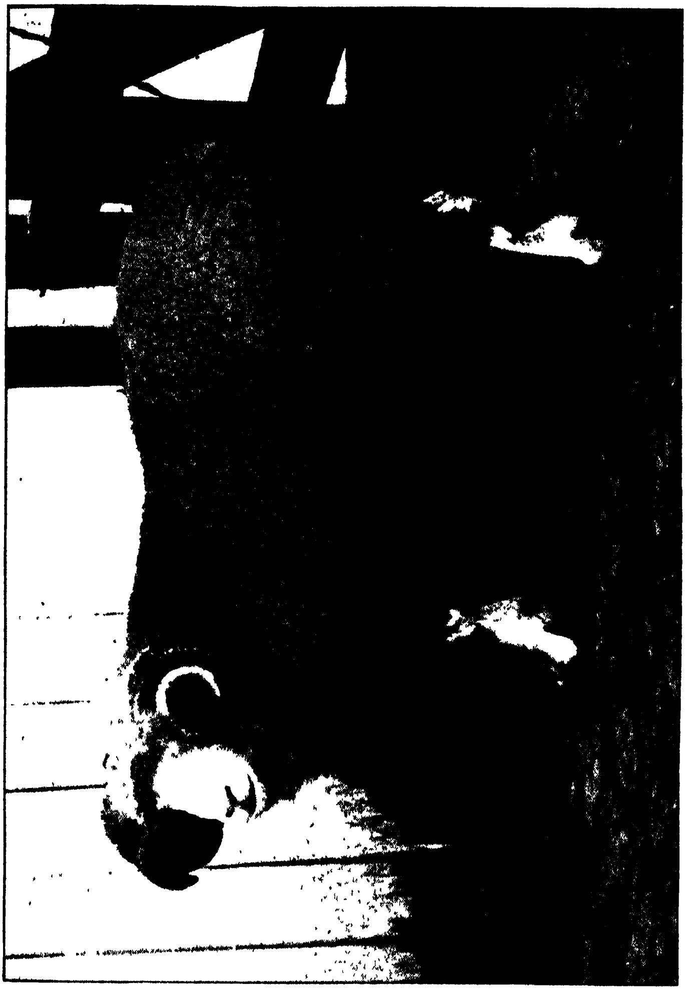
DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

With a view of publishing in the "Journal" the dates of meetings of the branches of the Agricultural Bureau, Hon. Secretaries are requested to forward dates of their next meeting in time for publication.

Branch.	Date of Meeting.		Branch	Date of Meeting.	
	1903	1903.		1903	1903
Balaklava	June 13	July 11	Morgan	June 6	July 4
Booleroo Centre	9	7	Mount Compass	13	11
Bowhill	13	11	Mount Remarkable	4	10
Brinkworth	5	3	Mundoora	5	—
Burra	12	10	Nantawarra	10	8
Bute	9	7	Naracoorte	13	11
Caltowie	8	—	Narridy	—	4
Cherry Gardens	9	14	Norton's Summit	12	10
Clare	5	10	Onetree Hill	5	10
Colton	6	4	Penola	13	11
Crystal Brook	6	—	Port Broughton	8	—
Eudunda	8	13	Port Elliot	20	18
Finniss	1	6	Port Lincoln	19	17
Forest Range	4	9	Port Pirie	6	—
Gawler River	5	10	Red Hill	9	7
Gladstone	6	4	Reeves Plains	5	10
Hartley	—	10	Rhine Villa	5	10
Inkerman	9	7	Riverton	6	4
Johnsburg	6	4	Saddleworth	20	18
Kanmantoo	5	10	Stockport	8	6
Kapunda	6	4	Strathalbyn	15	20
Kingston	6	4	Wandearah	8	6
Koolunga	4	9	Whyte Yarcowie	20	18
Lucindale	15	—	Willunga	6	4
Maitland	6	4	Wilmington	10	8
Mannum	5	—	Yankalilla	5	—
Minlaton	27	25			

OUR BREEDS OF SHEEP.

Under this heading we propose illustrating good types of the various breeds of sheep that have become successfully adapted to South Australian climatic and economic conditions. Every care will be exercised in the selection of illustrations; and as no animal not well representative of the best characteristics of his breed will be admitted it is hoped that they will not be without educational value. Prominent breeders, to whom most of the illustrations are due, have, with characteristic courtesy, extended us their further co-operation by supplying short notes on the breeds, with which they are successfully connected. We hope at later date to follow this up with illustrations of other domestic animals typical of South Australia.

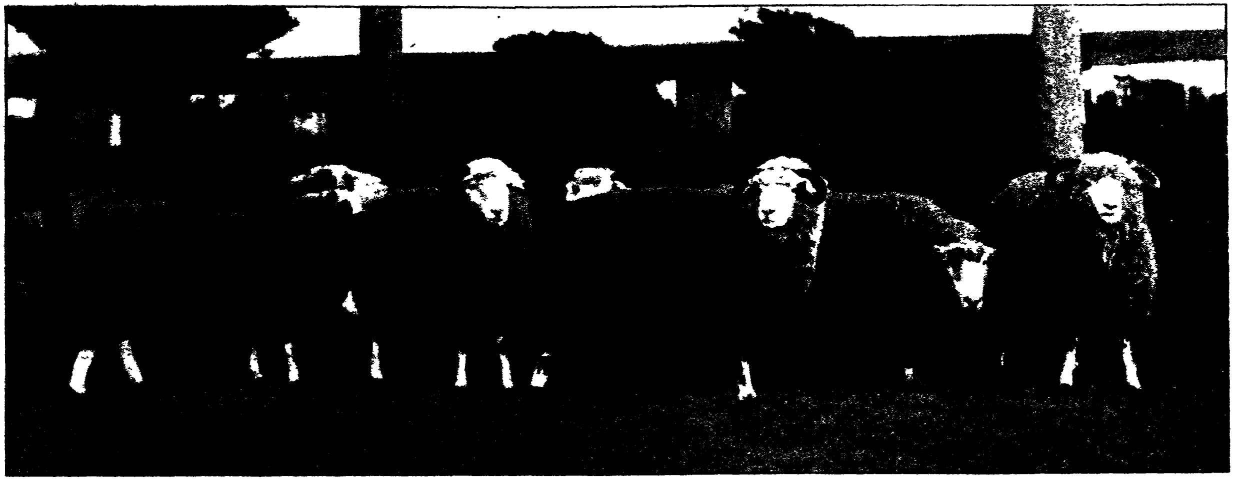


Dorset Horn Ram, "Somerset."

Bred by S. Kidner, Wolverton, Somersetshire. Imported by John Melrose, Ulooloo

Dorset Horns.

The first individuals of this breed imported into South Australia were introduced by Mr. John Melrose, of Ulooloo, in 1895. It was somewhere about that time that the great possibilities of the fat lamb trade with England were



DORSET HORN EWES.

Bred by W. C. Groves, Whitcombe, Dorchester, England. Imported by John Melrose, Ulooloo.

While this illustration shows the general characteristics of the ewes, it does them scant justice individually, as the photo. was taken soon after landing.

beginning to dawn upon us; and in this connection the high reputation of the Dorset Horn for early maturity attracted Mr. Melrose's attention to the breed. He commissioned Mr. Thornton, the well-known purchaser of pedigree stock, to secure for him some well-bred ewes and rams, possessing in the highest degree all the leading qualities of the breed. At the time Mr. W. C. Groves, a breeder of repute of Dorchester, was selling off his flock, and Mr. Thornton was fortunate enough to secure privately what he looked upon as the pick of the flock. His purchases included eight ewes, that are shown in our illustration, and one ram, "Cambridge," that was one of a pen of five lambs that secured a first prize at the Royal Agricultural Society's Show. Mr. Thornton purchased another ram, "Somerset," from Mr. S. Kidner, of Wolverton, thus supplying the changes of blood that would be necessary in the building up of the flock.

It is perhaps as yet too early in the day to forecast the future of this breed in South Australia. So far as can at present be ascertained its home reputation has not suffered in our midst. The Dorset Horns are hardy and well able to develop and keep in condition on our ordinary indigenous herbage; they are exceedingly prolific, twins being frequent, and three lambs not uncommon. In 1901 Mr. Melrose reared 47 lambs from 34 ewes without any loss of condition on the part of the mothers. They are large-framed sheep, with well-developed bodies and limbs, although in point of general conformation they fall short of the more delicate Southdown. The flesh is of good quality, and free from tallowy flavour, characteristic of the Lincolns and Leicesters. Their weak point lies in their fleece, which is generally very light. It is a question, too, whether their heavy horns might not with advantage be dispensed with.

Nobody supposes that any English breed of sheep will ever supplant the Merino in Australia. Nevertheless in the rearing of early maturing lambs their aid is indispensable. Which breed will be chosen will perhaps be decided by local conditions, or even by personal predilections. The Dorset Horn, the Lincoln, the Shropshire, and even the Southdown, all have their special adherents. Some even favour complex crosses of several of the breeds with Merinos. It does not at present seem probable that any one breed is likely to be adopted to the exclusion of all others. The great value of the Dorset Horn is undeniable. From a ram of this breed the Merino ewe rears a well shaped, rapid-growing lamb that can perhaps under equal conditions be put on the market earlier than any other Merino cross. The finest lambs, however, as has been repeatedly proved at the Roseworthy College, are obtained from the crossbred ewe by the Dorset Horn ram. Two years in succession—1901 and 1902—lambs bred in this manner took the first prize at the Royal Agricultural Society's Show. The crossbred ewe is in every respect a fine animal, exhibiting in its general framework many of the characteristics of the sire. They are good mothers, prolific, and very hardy. Their fleeces are generally considerably improved in weight, although in general still below those of pure Merinos.

Mr. Melrose, to whom we are indebted for most of these notes, states that he has had no reason to regret his enterprise in introducing this new breed to South Australia. At Uloolоo they have in every respect maintained their English reputation. Mr. Melrose has sold ram lambs in every one of these States and New Zealand, excepting Tasmania and Queensland.

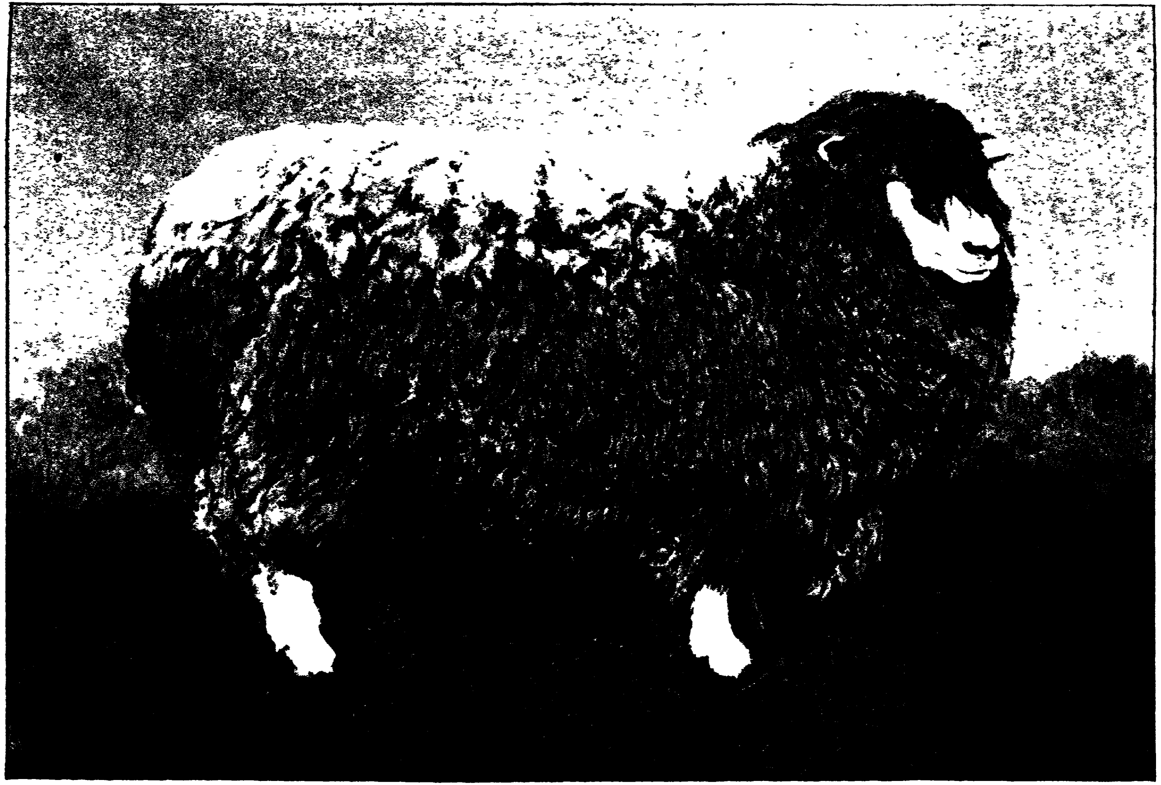
THE AUSTRALIAN LINCOLN SHEEP.

BY C. H. ANGAS, COLLINGROVE.

The Australian Lincoln sheep differ somewhat from those bred in England at the present time in type of wool, although in general appearance, and in many excellent qualities of hardiness of constitution and size, they are equally renowned in both places. It may be that Australian conditions of feed and climate enable us to grow a wool of greater quality and lustre than the colder latitudes of Great Britain permit; but the fact remains that the Lincoln sheep bred here are finer and more lustrous, if possibly not quite so heavy in fleece.

The Lincoln should possess a large symmetrical frame, not too leggy, broad in the back, with well-sprung ribs and a fairly long but proportionate neck. The

LINCOLN RAM, "DREYFUS."
Bred by J. H. Angas, Collingrove, South Australia. First and Champion, Adelaide, 1899.



Lincoln Ewe, "Lustre Queen."

Bred by J. H. Angas, Collingrove, South Australia. First and Champion, Adelaide, 1897 and 1898.

whole body should be well covered nearly to the ground with a long fleece of very lustrous wool, showing a well-defined, bold wave—quite distinct from crossbred, a most objectionable feature which many otherwise good sheep are apt to produce on the arm and thigh, and also at times on the belly and round the cheeks. The lock should be as large as possible compatible with the required character, and the fleece should be dense, and with a good belly and well-covered back. Needless to say, the quality of the wool should be as even as possible all over, with no coarseness about the breech. The head should be well-bred-looking and clean cut, broad in the forehead—as becomes a good fattener—and not too long, free from wool, except the topknot, which should be of similar type to the fleece, and not crossbred-looking. The ram's head illustrating this article is very nearly perfect, and his fleece shows an even character of wool from neck to thigh very distinctly.

Many good-woolled Lincolns are flatsided. This is a sign of bad constitution, and is greatly against the rams if used—as they often are—for breeding crossbred lambs, like begetting like.

There should be no sign of horns in either rams or ewes, and there is, as a rule, no wool upon the front legs below the knee, but generally a little below the hocks on the hind legs.

Both the sheep illustrated here were very good specimens of their breed The ewe was grass fed only, while the ram—which was probably the best Lincoln ever exhibited in Adelaide—had been artificially fed for about three months.

PRUNING NEWLY-PLANTED FRUIT TREES.

By Geo. Quinn, Horticultural Instructor.

Every person who plants a fruit tree should first form a clear conception of a design upon which it should be trained. If he wishes to grow a tree with a long stem and spreading branches, so that shade may be afforded to man or beast, the young tree should be specially treated to secure the accomplishment of such object. If, however, he desires to grow a tree which will prove economical in all cultural operations, such as pruning, spraying, and harvesting the crops and will also shade the root system and stem of the tree, he must follow another course.

In the shaping of the tree the first pruning is therefore of the utmost importance. In Plate I. three young trees which are fair types of the trees procured from the nursery are figured. These are all peach trees, but the formation of their roots, stems, and branches will fairly illustrate the development of most kinds of deciduous fruit trees. The first consideration in any design is setting a stem. It should not be forgotten that at whatever height from the ground the central stem is severed when planting that will be the height of the stem for the tree's lifetime, unless special measures are taken to carry on another leader. There is a popular delusion that the heights at which the branches emerge from the young stem in the nursery are the natural positions for them, and it is not wise to attempt to alter them. This is not so, however, as the emergence of these branches is largely a matter of circumstances. The tree shown in Fig. I., Plate I., has been topped in the nursery rows; consequently the few topmost buds near to the point of severance have given rise to strong shoots. In Fig. 2 the central stem ceased to grow at midsummer, and when a second flow of sap occurred the lower branches started to grow with increased vigour. The tree represented in Fig. 3 was grown uninterruptedly in a crowded bed; consequently no light or stimulus rested about the lower buds to cause them to start into growth.

In Plate 2 methods of pruning these trees are illustrated. In Fig 1 the tree retains the length of main stem it was given in the nursery by topping. In Fig. 2 it is severed so that the main stem will be of a similar length. The tree shown in Fig. 3 is cut off at a height of about 20 inches from the ground.

Having decided upon the treatment necessary to form a main stem, the next consideration is to set the main arms. The main arms are permanent

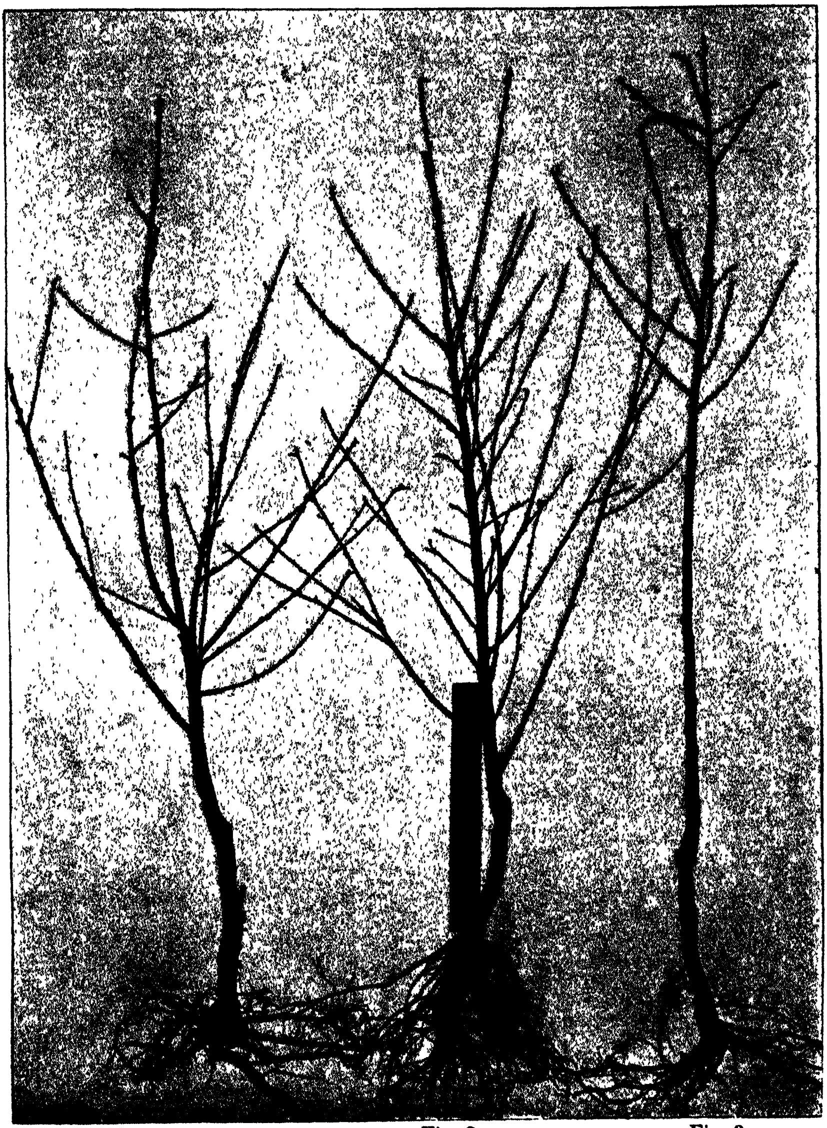


Fig. 1. Fig. 2. Fig. 3.

Plate I.—Types of Young Trees as Grown in the Nursery.

parts of the tree; consequently they should be set in proper positions relative to the stem. Whatever number be selected they should emerge from the main stems to make angles as nearly equal as possible with it. In Plate 2, Fig 1, three shoots have been selected and cut back to three or four good buds, so as to induce a few strong shoots to arise. In Fig. 2 four branches have been retained and treated similarly. In Fig. 3 the tree has been cut back to a bare stem, and as the buds are placed spirally around it new shoots will arise therefrom. The roots also need attention. When the trees are lifted from the nursery bed a large proportion of the root system is broken off and left in the ground. This fact alone renders the reduction of the top absolutely necessary, for, though it may be perfect in design, the reduced root system could not supply it with moisture and nutriment. The roots should be trimmed by carefully removing all bruised and broken ends. It is claimed that by making the cut sections on the underneath side of the root the young roots arising therefrom tend to penetrate deeper. All withered fibrous roots which have been exposed to the sun or dry winds should be cut away. In Figs. 1, 2, and 3 of Plate 2 the trimming of the roots on the above lines is depicted.

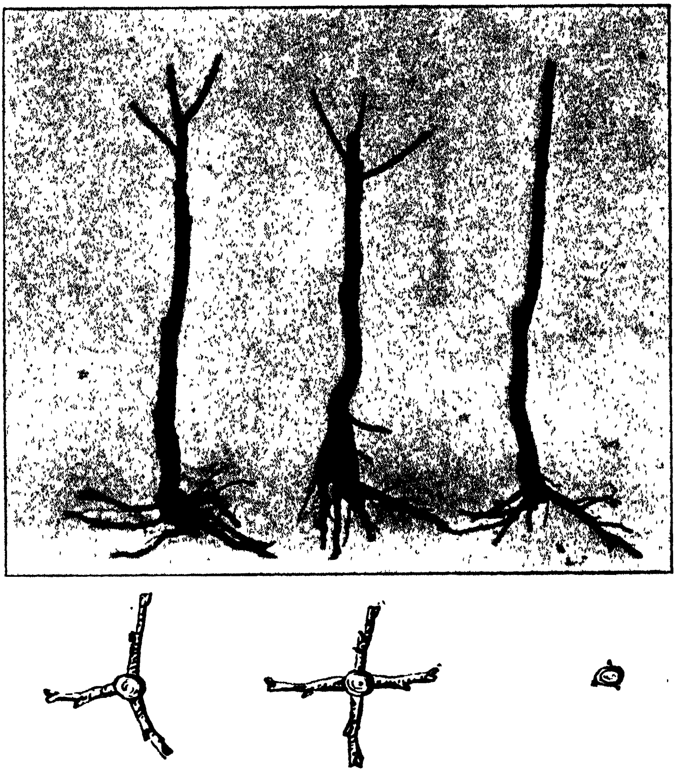


Fig. 1. Fig. 2. Fig. 3.

Plate II.—Suggested Pruning of Roots and Branches and Enlarged Ground Plan of Trees.

In general practice the treatment applied to Fig. 3 will be found most satisfactory, although to many it may seem like losing a year to sacrifice the branches already established. It will be noted that usually the wood of many of the branches formed in the nursery is not ripe; consequently it is not desirable to retain it to start the main arms. In other cases the wood is ripened and firm, but owing to the mutilation of the roots, and the consequent lack of balance between the absorbing and transpiring surfaces, it is generally advisable to cut off these branches and trust to the buds at their bases sending out new, strong, evenly balanced shoots. If the trees are composed of one season's growth from the bud or graft, these base buds can be relied upon with safety to produce the desired branches for the formation of main arms.

AGRICULTURAL BUREAU CONGRESS.

SEPTEMBER, 1903.

The fourteenth Annual Congress of the Agricultural Bureau of South Australia will be held in Adelaide during September Show week.

Members of the country branches are invited to suggest subjects of a practical nature for consideration. Papers on agricultural subjects by members are invited. Full details of dates of meetings and other arrangements will be notified later.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report on June 1, 1903:—

The weather conditions that prevailed during May could not have been more favourable for time of year, growing feed everywhere becoming abundant. Throughout the agricultural districts the young wheat plant in the earlier crops is coming along vigorously, and prospects are good, as the land in most places has received this season a thorough subsoil soaking, besides the refreshing showers that have fallen at short intervals since. In most pastoral districts feed and water are plentiful, and the outlook brighter than for a number of years past.

Business generally is sound and country trade for time of year fairly active. Some prospecting shows at Arltunga, Central Australia, appear to be making into payable mines, if reports that are published can be relied upon; at any rate, the district is now being fairly tested for minerals, and the balance of opinion favours the belief that an extensive, if not rich, mining field is likely to be opened. The weakening in the price of Copper during the month, with an unexpected fall of £4 a few days ago, causes some anxiety amongst those interested in mining for this metal. Considerable fluctuations in the price of Lead, with a general weakening tendency, also may possibly check somewhat the contemplated extension of operations on the Barrier fields, though even at present price some of the mines that were closed down a while ago, it is considered may be profitably reopened.

Favourable crop conditions in most agricultural countries of the Northern Hemisphere render a full wheat harvest there very probable, so that values in London during the month have not held up strongly, although quotations appear to be nominally unchanged. A feeling amongst the breadstuff traders in Australia that there is now enough wheat on way and here to carry the Commonwealth into next harvest has caused a cessation of further ordering from America. Vessels are now constantly reaching Australian ports from there, and we notice the arrival of the Orange Branch, from Argentine, with 2,000 tons landed at Port Adelaide. Some of this wheat has already been milled into flour and baked with satisfactory results, making a beautiful white loaf, equalling, it is said, the finest South Australian in a best season. Farmers in some parts having finished their seeding operations are beginning again to deliver wheat, but the market has decidedly weakened owing to the stoppage of orders from Melbourne and Sydney, only one steamer cargo for an eastern State having left Adelaide during the month. Local millers, however, have taken up some fair-sized parcels, but unless export demand from neighbouring States sets in again some wheat may have to be carried over until next season, which, to say the least of it, looks like a very unprofitable venture. There is at moment no export demand for Flour, South Africa procuring at present from the same source as Australia, whilst local trade is confined to immediate wants. Millers' Offal was sluggish during the month, owing to price here being rather above interstate rates. Trade in Fodder has also been quiet owing to the good growth of feed almost everywhere. Considerable shipments of Chaff were made to Sydney early in the month, but stocks accumulating there sellers here are being asked to withhold completing orders for a time to allow that market to clear a bit. Meanwhile dealers are offering to ship at lower rates Feeding Grains are also a shade easier.

Unusually heavy forwardings of Potatoes from South-Eastern districts have continued during the month, but a slackening off is now showing. The railway strike in Victoria for a few days caused some speculative purchasing, which for a week or two stimulated deliveries here and in Tasmania, but the abrupt termination of the labour trouble helped to bring about an utter collapse in price for a week or two, especially in Sydney and Melbourne, large quantities being sacrificed at considerable loss to owners. The tendency, however, is now towards recovery, though prospects in the near future do not point to the probability of much improvement in values. Onions also are plentiful, but stocks better held and gradually getting into the hands of stronger holders, though quotations remain unaltered.

The railway strike was seized upon as a pretext by holders of stored Butter to inflate prices, but the boom did not last many days, and the reaction brought quotations lower than ever. At moment a slight firming is evident, but values in the Butter Market must continue to rule low this winter in face of the heavy speculative stocks of spring packed now held, though new made may improve a bit in price as wintry conditions check supplies. Eggs have ruled high during the month, exporters finding great difficulty in filling their wants, athough quantities coming forward are heavy for time of year. The season is likely to be early, but prices will probably not run down much till we near August. Cheese weakened a little as demand slackened, and the low price of Butter is certain to keep this line from advancing. The output of Bacon has found ready buyers, and quotations seem to be fixed for a while at least. Export buyers for Sydney appearing on this market caused holders to advance their price, but trade only being possible at previous rates the market eased back with the result that some sales were put through and a good turnover for the month effected. Almonds have been short of trade wants.

The winter season auctions each Friday of Carcase Pork and Veal have been resumed, and satisfactory prices obtaining.

The improvement in demand for Poultry has continued throughout the month, especially for well-conditioned birds, which are short of trade needs.

MARKET QUOTATIONS OF THE DAY.

Wheat—At Port Adelaide, shipping parcels, 5/6 f.o.b.; farmers' lots, 5/5 on trucks, per bushel 60 ℔.

Flour—City brands, £11 15/ to £12; country, £11 10/ to £11 15/ per ton, 2,000 ℔.

Bran—1/2½; Pollard, 1/5 per bushel of 20 ℔.

Oats—Local Algerian and Dun, 3/ to 3/3; prime stout feeding white, 3/ to 3/3 per bushel, 40 ℔.

Barley—Malting, 4/6 to 4/9; Cape, 3/6 per bushel, 50 ℔.

Chaff—£5 2/6 to £5 7/6 per ton of 2,240 ℔., bags in, f.o.b. Port Adelaide.

Potatoes—Gambiers, £2 12/6 per 2,240 ℔.

Onions—Local, £3; Gambiers, £2 15/ per 2,240 ℔.

Butter—Creamery and factory prints, 11¾d. to 1/1½; private separator and best dairy, 10¾d. to 1/; well-graded store, 8¾d. to 9½d.; Victorian new, 10½d. to 1/; stored bulk, 7d. to 9d. per ℔.

Cheese—S.A. best factory, 6d. to 6¾d.; ordinary, 5d. to 5½d. per ℔.

Bacon—Factory-cured sides, 8½d. to 9d.; farm flitches, 6½d. to 6¾d. per ℔.

Hams—S.A. factory, 9½d. to 10d. per ℔.

Eggs.—Loose, 1/4½; in casks, f.o.b., 1/6½ per dozen.

Lard—In bladders, 6½d.; tins, 5d. per ℔.

Honey—2¾d. for best extracted in 60-℔. tins; Beeswax, 1/ ℔.

Almonds—Fine Softshells, 5¼d.; Kernels, 10½d. per ℔.

Carcase Meat.—Bright shop porkers, 5¼d. to 6d.; suitable baconers, 4½d. to 5d.; heavy weights and choppers, 3½d. to 4d.; prime veal, 4d. to 5d.; medium, 2d. to 3d.

Poultry—Dressed fowls, 5½d. to 6d. per ℔.; turkeys, 6½d. to 7½d. In live birds fine heavy-weight table roosters fetch 1/10 to 2/5 each; good-conditioned hens and cockerels, 1/2 to 1/8; small, very poor birds, 6d. to 9d.; ducks, 2/ to 2/9; geese, 2/6 to 3/6; pigeons, 5d.; turkeys, from 5½d. to 6¾d. per ℔., live weight, for ordinary to good table sorts.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, flour, and forage, for export are f.o.b. prices at Port Adelaide. Dairy products are city auction mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of May, 1903:—

Adelaide	1·70
Hawker	1·00
Cradock	0·62
Wilson	0·80
Gordon	0·73
Quorn	0·97
Port Augusta	0·46
Port Germein	0·49
Port Pirie	0·57
Crystal Brook	0·91
Port Broughton	0·82
Bute	1·30
Hammond	0·83
Bruce	0·73
Wilmington	1·16
Melrose	1·50
Booleroo Centre	1·44
Wirrabara	1·03
Appila	1·13
Laura	0·88
Caltowie	0·88
Jamestown	1·14
Gladstone	0·50
Georgetown	0·66
Narridy	0·86
Redhill	0·92
Koolunga	1·38
Carrieton	0·82
Eurelia	0·82
Johnsburg	0·82
Orroroo	0·56
Black Rock	0·83
Petersburg	1·15
Yongala	1·22
Terowie	1·85
Yarcowie	0·86
Hallett	1·29
Mt. Bryan	2·72
Burra	1·68
Snowtown	1·25
Brinkworth	1·64
Blyth	1·41
Clare	1·93
Mintaro Central	2·08
Watervale	2·40
Auburn	1·74
Manoora	1·66
Hoyleton	1·19
Balaklava	1·80
Port Wakefield	1·42
Saddleworth	1·85
Marrabel	1·69
Riverton	1·78
Tarlee	1·24
Stockport	0·93
Hamley Bridge	0·92
Kapunda	1·37
Freeling	0·94
Stockwell	1·75
Nuriootpa	1·59
Angaston	1·65
Tanunda	2·75
Lyndoch	1·12
Mallala	0·99
Roseworthy	0·95
Gawler	1·16
Smithfield	1·03
Two Wells	1·24
Virginia	1·40
Salisbury	1·50
Tea Tree Gully	2·00
Magill	2·02
Mitcham	2·43
Crafers	3·22
Clarendon	3·25
Morphett Vale	2·24
Noarlunga	1·39
Willunga	1·88
Aldinga	1·67
Normanville	1·84
Yankalilla	1·75
Eudunda	1·72
Truro	2·44
Mount Pleasant	1·50
Blumberg	1·61
Gumeracha	1·71
Lobethal	2·19
Woodside	1·98
Hahndorf	2·86
Nairne	2·26
Mount Barker	2·98
Echunga	2·57
Macclesfield	2·05
Meadows	2·18
Strathalbyn	1·16
Callington	1·23
Langhorne's Bridge	1·04
Milang	1·43
Wallaroo	1·04
Kadina	1·12
Moonta	1·57
Green's Plains	1·00
Maitland	2·42
Ardrossan	0·80
Port Victoria	2·09
Curramulka	2·32
Minlaton	1·14
Stansbury	1·11
Warooka	1·73
Yorketown	1·36
Edithburg	1·27
Fowler's Bay	3·70
Streaky Bay	2·84
Port Elliston	2·76
Port Lincoln	1·71
Cowell	1·25
Queenscliffe	1·20
Port Elliot	1·38
Goolwa	2·04
Meningie	1·46
Kingston	2·26
Robe	3·89
Beachport	2·39
Coonalpyn	1·16
Bordertown	1·71
Frances	1·51
Naracoorte	1·04
Lucindale	1·33
Penola	1·88
Millicent	2·03
Mount Gambier	2·89
Wellington	1·46
Murray Bridge	0·54
Mannum	0·30
Morgan	1·18
Overland Corner	1·56
Renmark	1·37

AGRICULTURAL BUREAU REPORTS.

Wilmington, May 6.

Present—Messrs. Maslin (chair), Schuppan, Hannagan, Bauer, McLeod, Broadbent, Sullivan, Zimmermann, Lauterbach, Payne (Hon. Sec.), and one visitor.

Standard Weight for Chaff.—Mr. Lauterbach initiated a discussion on the question of the adoption of a standard legal weight for a bag of chaff. After an interesting discussion it was unanimously resolved to ask that the matter be considered by the branches and brought before next session of Parliament. Members did not wish to prevent any one putting more than 40 lb. of chaff in the bag, but considered that 40 lb. net should be recognised as the minimum weight to a bag of chaff, and when more is put in it should be charged pro rata. It was admitted that, although 40 lb. was generally recognised as the weight of a bag of chaff, it was a frequent practice in large centres for considerably less to be sold by dealers in competition with merchants who supply full weight.

Stonegatherer.—Mr. Hannagan read a short paper on a mechanical stonegatherer. His idea was that a machine constructed in the style of a horse rake should gather the stones together into rows, to be afterwards carted away. He believed a strong, simple machine could be constructed at a cost of not more than £15 to £20. Considerable discussion ensued, and various ideas for machines were suggested, the one meeting with most approval being Mr. Maslin's idea of a machine somewhat after the pattern of a roadsweeper. Mr. Hannagan would like the matter thoroughly discussed by other branches, especially in districts where the loose stones were a source of trouble on the cultivated land. If 50 branches would contribute £1 1/ each, to be offered as a prize for the best machine for the purpose, some workable implement might result.

Caltowie, May 11.

Present—Messrs. Hewett (chair), Graham, Neate, Leahy, Petatz, Potter, Jettner, J. and A. McCallum, McDonald, Lehmann (Hon. Sec.), and four visitors.

Question Box.—This was question box night, and the evening was devoted to discussions on questions.

Sore Shoulders.—What is the best cure for a long-standing sore on a horse's shoulder? Some members thought a long spell the best thing; but others thought thoroughly cleansing by applying a mild blister and then bathing it well would be effective. Mr. Hewett said he had a horse very liable to sore on one particular spot; no matter what care was taken, this spot appeared bruised after the first day's work, and on the second day it would break open. It healed rapidly if the horse was not worked. He had collars made specially to fit the horse, and had tried all he could think of to get over the trouble, but without success. He thought perhaps there was something on the bone; he could find no trace of any foreign matter in the shoulder. He would like to hear from members of other branches as to treatment in such a case. [Mr. C. J. Valentine suggests pouring some boiling water over chopped-up wattle bark and bathing the shoulders occasionally with the water fairly warm. This should tend to harden the skin; also apply a little calendula to the spot. Do this for a little while before working the horse.—Ed.]

Harrowing after Drilling.—Members were unanimous that instead of rolling after the drill, it was preferable to harrow, especially after rain, as the harrows would pull up a lot of weeds merely transplanted by the scarifier and drill.

Mylor, April 11.

Present—Messrs. Neilson (chair), Narraway, Mundy, Hayley, and Hughes.

Apples.—Numbers of samples of named varieties of apples were tabled by different members. It was considered that if one variety could be classed as the favourite apple for this district it was the Rome Beauty; Jonathan and Dunn's Seedling are also very popular. Members thought the codlin moth had not been so destructive this year as was usual. Fruit has been plentiful and of fine quality. Discussion took place on best means of disposing of the fruit, and it was agreed that where possible the consumer should be supplied direct by the grower, saving market charges and middlemen's profits.

Crystal Brook, April 11.

Present—Messrs. R. Pavy (chair), W. and A. Hamlyn, G. and G. M. Davidson, Hutchison, Townsend, Venning, Morrish, and Symons (Hon. Sec.).

Co-operation.—The Chairman read from The Journal of Agriculture a paper by Mr. D. Hanna, of Gumeracha Branch, on this subject, and a good discussion ensued. The benefits of co-operation among farmers was admitted by all, but the members failed to see why it should be more difficult for farmers to unite and co-operate for their mutual benefit than it was for any other class.

Port Elliot, April 25.

Present—Messrs. McLeod (chair), Gosden, Green, Williamson, Brown, Basham, Pannel, Welch, Hargreaves (Hon. Sec.), and two visitors.

Lucerne.—Members were of opinion that the best time to sow lucerne in this district was in September. The young plant should be cut as soon as high enough to mow, as it did better with frequent cutting when young.

Southern Conference.—Members who attended Conference at Strathalbyn and Bureau Show at Mount Compass reported on proceedings of the two gatherings.

Scales Bay, April 28.

Present—Messrs. Roberts (chair), Atcherson, R. and J. Thomas, Crowder, G. and A. Newbold, and two visitors.

Fertilisers on West Coast.—In reply to question as to best way to distribute fertilisers broadcast, members were of opinion that it could only be done satisfactorily by hand. Discussion ensued on the results of the use of phosphates in the district last year. Mr. A. Newbold said that the fertilisers proved a failure last year. Two of those who used super got no crop at all; others only got a poor return. The results on the Chairman's experimental plots, as published in the April issue of The Journal of Agriculture, were of no value, as Mr. Roberts's crops averaged nearly 4 bushels per acre. Mr. Roberts believed the failures last year were due to ignorance on the part of the persons using the drills, which were often loaded with wheat and manure. The ground being loose and dry, the wheels of the drill sunk in three or four inches deep, the seed being covered to a depth of five to seven inches. Owing to the light rainfall much of the seed sown too deep perished, and the crop altogether was poor.

Buckbush.—The Chairman considered buckbush (Salsola kali) one of the best plants for summer feed for sheep. On a paddock of 150 acres he kept 700 sheep for two months, and they were in splendid condition when removed. Members agreed that buckbush and cockspur were the two best summer fodders for sheep for this district.

Gumeracha, April 20.

Present—Messrs. Moore (chair), Bond, Norsworthy, Lee, Jamieson, Kitto, Monfries, Foote, and Martin (Hon. Sec.).

Dairying.—Mr. Jamieson gave an address on "How to make a living on 80 acres of land in this district." On rented land two things were essential—sufficient capital and practical knowledge and energy. The district was decidedly favourable for dairying, which would have to be the main industry of the settler. If buildings existed on the land to be rented, he should have £400 as capital. He would require 20 cows, 1 bull, 3 brood sows, 2 medium draught horses, and some fowls; also cream separator, van, plough, harrows, small cultivator, corncrusher, grasscutter, horserake, &c. A man and a boy would be required to work the place. Of the 80 acres, 20 acres should be in lucerne, 20 acres cow pasture, 10 acres in wheat, and 10 in peas. The balance would be the homestead allotment, including small areas devoted to mangolds, sorghum, potatoes, lucerne for pig pasture, and fruit trees, besides buildings, yards, and a fair-size paddock for the calves. From April to September it would be necessary to house the cows at night, also in the daytime during wet weather. He estimated a return of £295 per annum, made up of £160 from cows, £100 from pigs, £24 for potatoes, and £11 for poultry and sundries. Against this he would have the following expense:—Rent, £50; labour, £117; bran and pollard, £50; repairs, £10; interest on capital, £20; sundries, £13; or a total of £260. It was unanimously agreed that a man could make a living on a section of 80 acres on the lines laid down by Mr. Jamieson, though members generally thought he had considerably underestimated the profits on the year's work.

Angaston, April 18.

Present—Messrs. Sibley (chair), Snell, Smith, Heggie, Rundle, Friend, Thorne, Vaughan, Matthews (Hon. Sec.), and two visitors.

Australian Agriculture Criticised.—Exception was taken to the disparaging remarks by the Russian agricultural visitors concerning the Australian farmer and his methods. His remarks concerning "filthy dairies" were specially challenged, and members emphasised the statement of the Victorian Dairy Expert that the price realized by our butter in the London market was in itself a refutation of the criticism in question.

Co-operation.—Mr. Trimmer initiated a discussion on "Does the producer get full value for his produce?" arguing strongly in the negative. Members agreed in the main with many of the points raised by Mr. Trimmer, fully realizing that a canning factory in the neighbourhood would be of great benefit, saving time, cartage, and waste. Mr. Smith outlined a scheme for a factory, but members considered it would be necessary to secure the unanimous co-operation of the fruitgrowers of the district prior to taking any definite action.

Lipson, April 11.

Present—Messrs. Potter (chair), Brougham, Carr, Baillie, Provis, Thorpe, Barraud (Hon. Sec.), and one visitor.

Tuberculosis.—The Secretary would like to know if there was any simple means of telling whether an animal was suffering from tuberculosis. Cattle sometimes are affected by cought, but the owner could not say whether it was due to tuberculosis or some simple ailment.

Fodder for Sheep.—Discussion took place on the question as to whether it was profitable to grow fodder such as Cape barley or rape for sheep; also summer fodders on the fallow. Decision on the matter was postponed.

Annual Report.—The Hon. Secretary's annual report showed that ten meetings had been held during the year, with an average attendance of over nine. Two papers have been read and discussed, and the meetings generally have been instructive. Great interest was shown throughout the district in the experimental wheat and manure plots on the Chairman's farm. The Chairman and Hon. Secretary were re-elected for ensuing year.

Morgan, April 11.

Present—Messrs. Windebank (chair), R. and H. Wohling, Bruhn, Pope, Hahn, and one visitor.

Indian Fig or Opuntia.—The Chairman stated that the plants of thornless opuntia or Indian fig, seem to grow readily no matter how carelessly they are planted, and require very little moisture to start them into growth.

Rules, &c.—Circular from Secretary for Agriculture with suggestions on resolutions of Officers' Conference were discussed, and it was agreed to adopt the suggestions as far as possible as rules for carrying on the work of the branch.

Improvement of Grazing Land.—The Chairman read a short paper on the possibility of improving the carrying capacity of the land, or restoring the feed to enable it to carry as much stock as it did 25 years ago. Before the land was surveyed for selection the district carried about 200,000 sheep, besides horses and cattle, in a good season, and about 40,000 sheep in a bad year. He doubted if more large stock were kept in the district now than when the squatters held the land. The first step to improving the carrying capacity of the land was to wire-net all the blocks to allow of the rabbits being destroyed. Then bluebush, cotton bush, saltbush, and other indigenous forage plants would need to be cultivated and protected. Grazing leases on easy terms would be required, as they could not put on much stock until the bush was well established. The various trees, such as sandalwood, mulga, sheaoak, &c., that stock will browse on should also be planted, and any plants from other dry countries likely to be of value should be tested. He thought that if half the money wasted in trying to grow wheat in these districts had been spent in the cultivation and conservation of useful fodder plants they would be in a different position to-day. He would like to see the Government establish an experimental plot for the cultivation of drought-resisting fodder plants outside Goyder's line of rainfall. Members were of opinion that paddocks that have been fed bare should be left unstocked for some time in a good season to give the bush, &c., time to make good growth.

Davenport, April 30.

Present—Messrs. Trembath (chair), Lecky, McDowell, McDonald, Hodshon, Magrath, Holdsworth, and Pybus (Hon. Sec.).

Turkeys.—Mr. Pybus read a paper on "Rearing and management of turkeys." A lot of people were under the impression that turkeys were more troublesome and difficult to rear than other poultry, but his experience was the reverse. He found the white turkeys, however, more delicate than the bronzewing or black. In hatching eggs he made the nest on the ground, as they get moisture from the soil. He always put the eggs under turkeys when possible, as they are quieter and more careful than hens. For the first week or two the chicks seem to have no idea of getting out of the way of the mother, and the turkey hen does not scratch about as much as a hen. He got best results from eggs set in December or early in January; at three to four months old is a critical time with young turkeys, and if at this time there is a little green feed, in the shape of bush, grass, &c., they will travel about a good deal and pick up many kinds of food, which adds to their vigour and health. Turkeys hatched from eggs set early in spring will have to depend more on the food provided by the owner, and will not get the variety essential. Previously he used to feed the chicks for the first two weeks mainly on chopped egg and onions, but this year he had used principally lucerne chopped up and boiled wheat. Twice a week they got bran and pollard mixed with a little charcoal and bonedust. The water for drinking is supplied in galvanised iron vessels similar in shape to those used for cage birds; the tins hold about a quart, and are washed out each day. If larger vessels are used, they hold so much water that there is a tendency to leave them for two or three days. The vessels are made so that the chicks cannot stand in the water and foul it. Once a week a little green copperas (sulphate of iron) is added to the water. After the turkeys are about 12 weeks old they are not much trouble, as if they have a run they can look after themselves. He considered turkeys quite as profitable as hens, as there was always a good market for young heavy birds. They require less grain proportionately than fowls, as they eat so much green stuff, bush, &c. The best price was obtained for fat turkeys for the Christmas trade. Care must be taken that the birds do not degenerate; start with eggs from a good strain, and get a change every three or four years. Always try to get a first-class gobbler in the yard. Most of the members agreed that if carried out on proper lines turkey rearing would prove profitable in the north. The necessity for a good run for the birds was recognised; some members considered them unsuitable for small allotment owners. Mr. McDonald said that lice were the most frequent cause of failure with young turkeys; they would be found at the back of the head, under the beak, and between the quill ends of the pin feathers. Often owners lost turkeys from this pest, and were quite unaware of the cause of death. He considered it necessary to look carefully after the young turkeys, but when fully feathered they were very hardy. The Chairman found carbolic and olive oil very effective against lice; it should be applied to the back of the head when the chicks are two or three days old.

Meadows, April 22.

Present—Messrs. Pearson (chair), Ellis, Usher, Stone, Buttery, Griggs, Nicolle, Brooks, Murphy (Hon. Sec.), and three visitors.

Spraying for Codlin Moth.—Mr. Pearson reported having sprayed his apples at intervals up to Christmas. The early apples were clean, but 25 per cent. of the late variety he was now picking were affected. He thought it would be necessary to continue spraying the late fruits up to the end of March.

Blackberries, Briars, and Furze.—Mr. Pearson said he had recently been on a trip through the hills district with a view to ascertaining to what extent the country was overrun with blackberries, briar, and furze bushes. He found that a strip of country over 40 miles in length by 10 miles in width was largely occupied by one or other of these objectionable plants, which would cost, at a low estimate, 5/ per acre to clear. The question of how to deal with them was of great importance. In 10 years' time, unless vigorous efforts were made, the cost of getting rid of them would be doubled. In dealing with blackberries he thought the best plan was to burn the bushes and clear away all stumps, &c., so that the new growth could be mown with a strong scythe twice a year; small patches could be grubbed right out. Briars can be pulled out by the roots with a team when the ground is well soaked by putting a chain round the clumps. If the furze is cut and the cuttings left about them, the plants will die out. Mr. Stone suggested folding pigs or sheep on the blackberry patches after cutting the bushes. It was agreed that the bushes in question were a serious pest to landowners, and that vigorous efforts should be made to get rid of them.

Renmark, April 16.

Present—Messrs. Waters (chair), Nuthall, Miller, Evans, and Cole (Hon. Sec.).

Beekeeping.—Mr. Waters read a short paper on beekeeping for beginners, and an interesting discussion ensued.

Port Broughton, April 20.

Present—Messrs. Harford (chair), Dolling, Bates, Button, Pattingale, Tonkin, Dalby, and Barclay (Hon. Sec.).

Summer Fodders.—Mr. Tonkin tabled samples of rape and white mustard, and stated that his cattle would eat neither, so that his labour in growing them was thrown away.

Wheat Experiments.—Mr. Harford reported on experiments with wheats.

Maitland, May 2.

Present—Messrs. Smith (chair), Kelly, Heinrich, Bawden, Tossell, Moody, Bowman, Jarrett, Williams, and Bowey (Hon. Sec.).

Wheat Experiments.—Reports were received from different members on their experiments with wheats. Mr. T. Bowman reported that Karkov (Russian), Manitoba, and Bluestem were not at all suitable, being very late, with small grain. Bobs shed its grain too freely. Marshall's Hybrid was a very good wheat, strong in straw, and holds grain well; 35 acres sown about end of May yielded 23½ bushels per acre. Twenty-seven acres was sown to Ranjit wheat; frost cut the plants when 6 in. high; yield, 13 bushels per acre; goes down badly. Silver King was sown on 38 acres, and yielded 25½ bushels per acre; a splendid wheat; stands up well and holds the grain. Majestic has a small grain, stools well, is rather late, but a good hay wheat; yield, 14 bushels per acre. These four wheats were all sown with 80 ℔. of super per acre, and were put in the same paddocks. Mr. Heinrich sowed 1 ℔. Federation and got 19 ℔. back; 1 ℔. Manitoba yielded 9 ℔. grain. Mr. Bowey got 26 ℔. from 1 ℔. of Cumberland. Mr. Treasure sowed 1 ℔. each of Jonathan and Manitoba; the former yielded 21 ℔., and the latter 6 ℔. The Russian and Egyptian wheats—Ulta, Padue, Crimean, and Mishrike—sown by various members proved failures. Members considered that Federation, Cumberland, and Jonathan promising varieties.

Poultry on the Farm.—Discussion on this subject took place. A resolution that poultry were profitable on the farm was carried.

Annual Report.—The Secretary reported that nine meetings were held during the year, the average attendance being six. Two visits had been made to members' homesteads, but no papers had been read during the year. Messrs. E. W. Moody, J. N. Smith, and W. Bowey were elected Chairman, Vice-Chairman, and Hon. Secretary respectively for ensuing year.

Nantawarra, May 6.

Present—Messrs. J. Nicholls (chair), R. Nicholls, Dixon, Belling, Herbert, Sleep, Dall, Greenshields, and Spencer (Hon. Sec.).

Super on Light Dry Land.—Discussion arose as to whether it was advisable to apply heavier dressings of super to light dry soils than to better class land. Difference of opinion existed on the subject. Some members thought that the poorer soil would profitably respond to the heavier dressing, while others doubted whether they would get any extra yield unless they got more rain. It was thought, however, as the benefit of the manure on the grass after a wheat crop was so marked, that if an increase in the dressing did not tell much in the crop the pasture would benefit. The Hon. Secretary stated that he had dressed a small plot of grass with super at the rate of 1 cwt. per acre, and the effect was already noticeable, the grass being thicker and better on the manured plot.

Mylor, May 16.

Present—Messrs. W. Nicholls (chair), J. Nicholls, Narraway, T. G. and E. J. Oinn, Bradley, and Hughes (Hon. Sec.).

Officers—Mr. Clough tendered his resignation as Hon. Secretary, as he was leaving the district. Messrs. W. Nicholls and W. H. Hughes were elected Chairman and Hon. Secretary respectively for ensuing year.

Fruit Samples.—Mr. Oinn tabled Rome Beauty and London Pippin apples, and pear-shaped quinces of exceptional quality, weighing 2 ℔. and over. Mr. Hughes tabled Vicar of Winkfield, Beurre de Esperen, Josephine de Malines, Broom Park, Prince of Wales, and an unnamed pear. The fruits were sampled and the Prince of Wales voted the best flavoured pear for present season of the year. London Pippin apple was considered a first-class all-round apple for this district.

Forest Range, May 7.

Present—Messrs. Monks (chair), Townsend, McLaren, Waters, Gunn, Plummer, Hackett, R., J., H., and F. Green (Hon. Sec.).

Apple Bitterpit.—Mr. J. Vickers forwarded a paper on apple bitterpit Considerable attention has been given during the past season to the effect of the codlin moth on our apple export trade, while but little has been said in regard to a far more insidious disease, viz., "bitterpit," which, in his opinion, was destined to play greater havoc with the export trade. In England every one was more or less familiar with the codlin moth in apples, and from whatever country they import fruit the presence of a few wormy apples creates no surprise. Besides this a burrowed apple is not altogether wasted for cooking purposes; whereas with "bitterpit" in a bad form almost the whole of the fruit was spoiled, the brown pitting extending from just beneath the skin nearly to the centre of the apple. There were hundreds of acres of apples in South Australia just coming into bearing, and no doub some of these orchards were owned by comparative beginners, who would not be the best judges of what were suitable fruits to export. The first crops from these young trees would undoubtedly be fine fruit to look at, and they will naturally be exported in considerable quantity. There was, however, great danger that our trade would be seriously affected if such fruit is exported, as they all knew that on young, vigorous trees the "bitterpit" showed up worst. One of the greatest drawbacks in connection with this disease was that it often showed no indication whatever for some weeks after the fruit was gathered. Fruit put aboard the steamers here in almost perfect condition will sometimes be very badly affected when it reaches Europe. He had consulted all the works on apple growing that he could get hold of, and also questioned a number of growers competent to express an opinion, and it was the general opinion that the disease was not caused by any insect or fungus. It was thought that the sap in some way was responsible. Apples of good texture—that is, fruit that will cook to a jelly—are more susceptible than those of a tougher or closer texture. Climatic conditions are undoubtedly largely responsible; a wet autumn means more trouble. The disease is also worse in wet localities and on low-lying, badly drained land. It also appears to take a somewhat different and milder form on dry ground compared with low, wet ground in the same locality. Heavy pruning is also largely responsible, the fruits on the strong, vigorous shoots that result being often badly pitted, while those grown on the mature wood are quite sound. He thought the evidence pointed to a decay of the cells of the fruit brought about by an excess of sap, and suggested as preventive measures drainage, liming the soil, and in the case of the more susceptible varieties no winter pruning after the tree has been formed. Considerable discussion ensued. It was agreed that heavy pruning and excessive moisture increase the "pit." Members would like to know whether it would be possible to learn anything from an analysis of the affected parts. Mr. Townsend suggested "bleeding" the trees liable to the disease in order to check the flow of sap.

Lipson, May 9.

Present—Messrs. Potter (chair), Brougham, Thorpe, Wishart, McCallum, Baillie, G. and C. Provis, Brown, France, Barraud (Hon. Sec.), and one visitor.

Pickling Wheat.—Discussion on this subject ensued. It is the general practice to pickle the wheat on a floor, pouring bluestone solution over it, and turning it well.

Feed for Stock.—Members thought it would pay to grow feed specially for stock for the local market, even if it were not found possible to export the lambs profitably. The Hon. Secretary was instructed to make enquiries as to prospects of outside markets. A visitor showed nice samples of early wheat and barley, measuring 2 ft. in height. Members thought that Cape barley would be the best to sow for early feed, and also that after fattening the sheep on a green crop, it would greatly improve the land to turn under the balance of the crop.

Inkerman, May 5.

Present—Messrs. Sampson (chair), Smart, Mugford,. Kennedy, Lonman, Board, Daniel (Hon. Sec.), and three visitors.

Change of Seed.—The following letter was received from Professor Towar:—

In reply to your letter regarding change of seed wheat, I would say that the practice is a common one, and is regarded as a good one, as it generally gives a larger and better product. I have before me Prof. L. H. Bailey's book on "Plant Breeding," in which he says in his chapter on change of seed—"The change is beneficial, because it fits together characters and environments, which are not in equilibrium with each other. A plant which has grown for several years in one set of conditions, becomes fitted into them, so to speak, and is in a comparative state of rest. When the plant or its progeny is taken to other conditions, all the adjustments are broken up, and in the refitting to the new circumstances new or strange characters are apt to appear." It is generally conceded that the great improvement in fruits, flowers, grains, and vegetables of recent years, is due to buying plants and seeds of dealers, thereby continuing the practice of changing the seed. I would in changing seed observe the following:—

1. That if a little change results in a little good, it does not follow that a great change will result in proportionately great good. Severe changes may result in failure of the crops to properly fruit or mature.

2. It is probably better to change from a cold and rigorous climate to a warmer one, than from the opposite.

3. It would naturally follow that a change from a wet to a dry climate would be equally unfortunate.

4 A change from one kind of soil to another, on the same farm or in the same district, often results in as much benefit as changing grain a distance of a hundred miles or more.

One of the most striking examples of the benefits of changing seed is in the practice in the States and Canada, in securing seed potatoes from the coldest districts where potatoes will grow, and planting them in the warmer climates. This practice pays a big profit, even after allowing for extensive freight charges. I know of intelligent practical men who prefer seed from poor, light land, to sow on rich heavy land, rather than seed from heavy soil, provided they can get plump, healthy samples of seed. I believe a case similar to this, is seen in the behaviour of sheep brought from the north and south. They say that sheep brought from the far north to this locality will do far better than sheep brought from the better conditions which prevail in the south-east I should be glad to know the oponion of the members of your branch on this subject.

Mr. Lomman stated that he got some seed wheat on one occasion from Mount Gambier, and had good results from it for several years.

Pickling Seed Wheat—Mr. Board initiated discussion on this subject. He was confident that, if the seed is fairly clean, pickling carefully and thoroughly done was a sure preventive of bunt. He used ½ lb. of bluestone and 1½ gallons of water to the bag of wheat. He used double this strength with some very badly bunted seed, but only about half of it germinated. For barley 1½ lb. of bluestone per bag was necessary. Members were of opinion that it was better to pickle the seed five or six weeks before sowing.

One Tree Hill, May 8.

Present—Messrs. J. Bowman (chair), Blackham, F. and G. Bowman, Flower, Ifould, Thomas, and Clucas (Hon. Sec.).

Stock Complaints.—Reference was made to reports of horse disease at Hawker, also to reported sudden deaths of cattle near Gumeracha recently. Mr. Flower had lost a valuable horse recently. The animal was in regular work, but was taken ill suddenly about midday, and died at 9 p.m. the same day. As the horse went blind and mad, and there were no abnormal appearances in any of the organs, the attack was considered to be cerebral.

Attendance at Bureau Meetings.—Mr. Clucas initiated discussion on this subject. He had been asked to take this matter up some months ago, with the object of stimulating interest in the Bureau work. The sparse attendance of visitors at the Bureau meetings seemed to indicate on the part of the general producing community a suspicion of an element of exclusiveness in respect to the meetings, which, however, members should do all they coul to dispel. Moreover, the absence of reference by any one branch to the reports from other branches was evidence of lack of healthy esprit de corps. Then it was desirable that the branches should be brought into closer touch with the expert officers of the Department. These officers had each his special duties to perform, which duties could not be altogether subordinated to claims for visits, so that any scheme providing for a round of visits would be unsatisfactory and impracticable. A glance at the curriculum of the Roseworthy College showed that the scope for experimental work there was not unlimited, and he thought the services of the members of the Bureau might be judiciously enlisted as auxiliaries. He was sure the experts would be only too glad to avail themselves of the researches of practical men throughout the State. The difficulty of maintaining a real live interest in the Bureau work was by no means a myth; those branches which had been in existence for a number of years had pretty well thrashed out the general round of subjects; and, besides, to the ordinary farmer writing a paper was a formidable task, not from want of ideas, but from lack of leisure and literary aptitude. Then even when papers were read they often were only scanned in a very cursory way by members of other branches. Some device to invest the papers in The Journal with special, instead of general, interest was necessary. This applied also, with less force, perhaps, to the contributions of the experts. The following ideas suggested themselves to meet some of these difficulties:—(1) A column in the Journal for notices and enquiries; (2) from time to time subjects be submitted through this notice column for discussion by branches; (3) that upon receipt of reports of discussions the officer who submitted the subject should collate the salient features and review them generally in the Journal; (4) that the experts use this column to elicit information and results of experiments; (5) that the branches or members be invited to use this column for mutual reference; (6) that with a view to bringing branches into more intimate touch, and supplying useful matter for consideration, the Chairman at each meeting invite members to bring under notice any paper read before any other branch which they considered of special merit; significance should be given to the practical and not to the literary merit; (7) that in order to stimulate public interest, each branch should convene yearly a public meeting, at which should be presented a concise report of its deliberations, results of experiments, &c., and the earnest co-operation of the visitors be sought. Mr. Ifould suggested that in view of the difficulty often experienced in getting members to write papers, they might adopt some plan of answers to questions. Questions could be submitted in writing, and handed to suitable members to answer at the next or some future meeting. The questions should of course, be framed to elicit practical information. Members generally endorsed the suggestions submitted, and thought good would result if they were given effect to; it was resolved to adopt suggestion No. 6 at next meeting.

Port Broughton, May 11.

Present—Messrs. Whittaker (chair), Harford, Tonkin, Pattingale, Gardner, and Barclay (Hon. Sec.).

Exhibits.—Mr. Tonkin showed plants of white mustard over 2 ft. high; he had a crop of five acres of this feed. Mr. Harford tabled trombone, weighing 58 lb., and a discussion on fertilising the flowers of the trombone and similar plants ensued. Members thought this was best done soon after the female flowers have opened, and when the pistil, &c., is a little gummy.

Breakwinds.—Members wished to know the best, quickest growing, and thickest hedge to plant as a breakwind. [Impossible to answer satisfactorily; everything will depend upon soil, climate, location, and purpose for which the breakwind is grown. Amongst the best hedges for breakwinds, the following are fairly quick growers where conditions are suitable:—Kaffir apple (Aberia caffraria), African boxthorn, Tagosaste (Cytisus proliferus), the tall Oleander, the native myrtle. The common bamboo is quick-growing, and makes a good break, as do a number of trees, but proximity to garden, &c., is an all-important factor.—Ed.]

Lucindale, May 2.

Present—Messrs. E. Feuerheerdt (chair), Carmichael, Langberg, Tavender, Matheson, Dow, Hensley, B. A. Feuerheerdt, and Dutton (Hon. Sec.).

Vine Diseases.—In reply to question, Mr. B. A. Feuerheerdt said sulphur sprinkled on the vines on a warm day before they flowered was the only known cure for oidium. Swabbing the stems in winter with a solution of 10 lb. sulphate of iron and ½ lb. sulphuric acid in 10 gallons of water was a good remedy for fungus complaints. Mr. Langberg said his vines died back in the summer, and the grapes turned sour. The Chairman had had a similar experience, which he could not account for.

The South-East.—Mr. Langberg read an interesting account of a recent visit to different parts of the south-east. He was much struck at the area of country between Lucindale and Millicent that was overrun with stinkwort, and thought it a pity that no action was taken to prevent so much good grass country being spoilt. Around Millicent he was surprised to note how many homesteads were quite shelterless, and as most of it is open, plain country, stock must suffer severely in the winter. The splendid growth of belts of gumtrees round some homesteads showed what could be done. The condition of the country around Mount Gambier itself was exceptional, the condition of the grass being wonderful for the time of the year. He attended the Conference of the Bureau, which was very interesting, but the attendance was poor. The showing of Bureau exhibits at the local show the day before was, he thought a mistake. Coming back he visited Glencoe district, which seemed very suitable for potatoes and other root crops. There seemed more system in the working of the land here than in other parts of the south-east. Between Millicent and Mount Gambier the sheep in a number of well-grassed paddocks were in poor condition, and it would appear that the grass did not agree with them. Mr. B. A. Feuerheerdt had also noticed the condition of the sheep in the locality referred to. He put it down to the fact that the best sheep and lambs found their way to the Adelaide market, the culls being kept, with the result that the progeny were badly shaped, and of little value for wool. In the Glencoe district he thought more use could be made of the land. The plough should be kept going more, and cattle fed on straw and hay treated with molasses.

Sand in Horses.—Mr. Carmichael found liberal feeding with pollard a good remedy for sand in horses.

Mount Compass, May 9.

Present—Messrs. Jacobs (chair), Cameron, Gowling, Hutton, Jenkin, Peters, Slater, Sweetman, F. and H. McKinlay (Hon. Sec.).

Potato Experiments.—Mr. Slater reported on experiments with different size seed potatoes. Three pounds of each kind were planted on November 1, 1902, and harvested on May 2, 1903. The following were the results with Daniels variety:—

4 potatoes to the lb., cut into 4 setts each, yielded 12 lb.
6 potatoes to the lb., cut into 3 setts each, yielded 16 lbs.
9 potatoes to the lb., cut into 2 setts each, yielded 18 lbs.

The plants in each case were earthed up. With smaller setts weighing 18 to the pound, not earthed up, larger potatoes and better yields were obtained. With the crowns cut out the yield was 21 lbs from 3 lbs. sown; with the side eyes cut out 19 lb., and uncut yielded 18 lbs. The results from White Prolific differed from the other yields:—

4 potatoes to the lb., cut to 4 setts each, yielded 90 lbs.
6 potatoes to the lb., cut to 3 setts each, yielded 83 lbs.
9 potatoes to the lb., cut to 2 setts each, yielded 65 lbs.
18 potatoes to the lb., planted whole, yielded 81 lbs.
2 lb. small sets, 28 to the lb., yielded 64 lb.

Very small potatoes are excluded from the yield in each case.

Mount Pleasant, May 8.

Present—Messrs. Phyllis (chair), Lyddon, Naismith, Godfree, Thomson, Maxwell, Miller, and Giles (Hon. Sec.).

Stallion Tax.—At previous meeting the following resolution was carried:—"That no stallion should be allowed to serve mares for which any fee whatever is paid unless he be licensed after thorough inspection by a veterinary surgeon, to be approved by the Government, and that the licence fee be £10 per annum."

Oats for Horses.—Discussion took place on the value of oats for horse feed. Mr. Miller stated that his experience was that the Algerian oats were the best for horses; they seemed to digest better than other kinds. Mr. Lyddon tabled two heads of oats found in a crop of Manitoba wheat last season; none of the members knew the oats, which will be further tested by Mr. Lyddon.

Port Pirie, May 9.

Present—Messrs. Johns (chair), Wright, Lawrie, Bell, Crispin, Smith, Morrish, Hector, Humphris, and Wilson (Hon. Sec.).

Coonalpyn.—Mr. Smith reported on a visit to Coonalpyn on the border of the so-called 90-Mile Desert. He was satisfied that there was a lot of country within reasonable distance from the railway line which would grow wheat profitably if properly cultivated and manured. The rents fixed varied from one-eighth of a penny to 2d. per acre, but the land for about six miles back was held for speculative purposes, and enquirers were asked fairly high prices for the goodwill of the leases.

Short Weight in Imported Manures.—Considerable discussion took place on the question of shortage in the weight of imported manures, which were mostly sold on the basis of ten bags to the ton. Mr. Bell referred to numerous complaints in this direction; he had found deficiencies of 7 cwt. or more in 5-ton lots. Mr. Johns weighed a 10-ton lot, consisting of two or more brands, and found a deficiency of 250 lb. on the total. Members thought farmers should protect themselves by refusing to sign any orders which protected the importer in respect to shortage in weights, and that in buying full weight should be demanded.

Thick Sowing and Heavy Manuring.—Professor Towar's statement that he was sowing 70 lb. of wheat and 1½ cwt. manure per acre was criticised. Members considered 70 lb. of seed too much, but agreed that 30 lb. per acre was too little. When a bushel per acre is sown, it was thought best to drill half one way and the balance across, but the extra labour involved was mentioned by Mr. Bell as an objection. Members considered 1½ cwt. of super per acre too heavy a dressing for local conditions.

Booleroo Centre, May 5.

Present—Messrs. Nottle (chair), Repper, Arthur, Steven, Michael, Clack, Murdoch, McMartin (Hon. Sec.), and one visitor.

Stump-jump Implements.—Mr. Michael asked whether the credit of the invention of the stump-jump implements was due to a farmer or to a mechanic. Members thought the idea originated with a farmer.

Feeding Down Wheat Crops.—Considerable discussion on this subject took place. The Chairman on one occasion saved his lambs by putting the sheep in the crop, and then reaped as much per acre off the land fed down as off the rest of the crop. The Hon. Secretary said the best crop he ever got was fed down until the beginning of August. Mr. Michael had turned his sheep on to some early wheat which had commenced to run up. Several members stated that they had in the past got satisfactory results where the wheat had been fed down early in the season, and it was the general opinion that this year the early crops should be fed down.

Yankalilla, May 1.

Present—Messrs. Kelly (chair), Grundy, Stone, Tonkin, Dennis, Leverington, Wood, Heggaton, Lovelock, and two visitors.

Annual Report.—The Secretary's report was read, and adopted, and the retiring officers thanked for their services. Mr. J. J. Grundy was elected Chairman, and Mr. G. H. MacMillan re-elected Hon. Secretary, for ensuing year. Mr. Grundy read a paper on "Wheatgrowing on Yorke's Peninsula."

Mount Gambier, May 9.

Present—Messrs. Mitchell (chair), Pick, Wedd, Barrows, Ruwoldt, Clarke, Watson, Edwards, Williams, Dyke, Wilson, and Lewis (Hon. Sec.).

Pitting Potatoes.—The Hon. Secretary stated that Mr. W. R. Allison had left with him a sketch showing method adopted in Yorkshire in pitting potatoes. The potatoes were carefully stacked in heaps 6 ft. wide at the base and 3 ft. high at the ridge, and as long as required. The heap is then thatched with straw and covered with earth to prevent damage by frost; space for ventilation is left about every 10 ft. along the ridge. The heaps are started on ground level, and a shallow trench is cut on each side to carry off the water. It was agreed that covering with earth was unnecessary, thatching to carry off the rain being sufficient.

Grass Fungus.—Correspondence was received from Professor McAlpine, of Melbourne, and the Department of Agriculture, identifying the rust attacking the rye grass as Puccinia coronata, or crown rust. There is no remedy that could be applied on a large area of infected grass; as a rule, not much injury resulted from the fungus except in moist, warm weather. The Chairman stated that the grass seemed to be quite free of the fungus now.

Weeds.—Mr. Clarke asked for treatment to get rid of horehound; it was very prevalent this year at Mount Schanck. Mr. Wedd and Mr. Pick thought that sheep would destroy it, but Mr. Clarke said his sheep would not touch it now. He had found a plant of Bathurst burr in his horse paddock. It was suggested that the seed had been brought by stock from Narracoorte, but Mr. Williams said he had never seen the plant about there. Mr. Wedd said it was plentiful towards Casterton. The spread of stinkwort was referred to; members thought landowners should be very careful to prevent this getting a hold.

Timber Trees and Wattle.—Some discussion took place on the growing of wattles and timber trees. Mr. Wedd said there was money in wattle-growing on their poorer lands, and he was convinced that in the future there would be a big demand for timber. A good paddock of stringybark would be almost worth a fortune in thirty years' time; true, they might not personally profit much from planting these trees, or encouraging the natural growths, but the future owners would. Mr. Pick suggested trying the ironbark, as it was very durable; he believed it would do on gravelly soil. It would be better for landowners to plant small areas than for the Government to put in a large area, as a single fire might destroy all the timber on the latter.

Colton, May 2.

Present—Messrs. P. P. Kenny (chair), M. S. W. Kenny, Kleeman, Barnes, McCracken, and Packer (Hon. Sec.).

Adelaide Show.—Mr. Packer read an interesting account of some of the exhibits at the March Show. He considered the show well worth a trip from the west coast to see. Numerous questions concerning various exhibits were asked, and a vote of thanks accorded to Mr. Packer, who promised some notes at next meeting on machinery at the show.

Strathalbyn, May 18.

Present—Messrs. M. Rankine (chair), W. M. Rankine, Watt, Meikle, Reid, Mules, and Cheriton (Hon. Sec.).

Southern Conference.—Papers read at the Conference were well discussed It was considered that Mr. Welch's paper on "Breeding and Feeding of Stock' contained views well worthy of adoption by stockowners. Mr. Hargreaves' paper on "Fruitgrowing" also met with approval, and a resolution was carried that the members endorse the advice contained in the paper. Other subjects were also discussed.

Murray Bridge, May 8.

Present—Messrs. Edwards (chair), Jaensch, H. and W. Schubert, and Lehmann (Hon. Sec.).

Feeding Horses.—Mr. B. T. E. Jaensch read a paper on "Feeding Working Horses on the Farm." Horses in regular work should be fed at regular intervals, and with not more than six hours between the meals. Long abstinence from food produces hunger, and a hungry horse will bolt its food, resulting in indigestion and colic. With hardworked horses care is doubly necessary, as not only would they come hungry to their long-deferred meal, but exhausted also, and in consequence the stomach is in such condition that half the food that would otherwise be digested will cause serious results. Hay alone, be it ever so good, is not fit food for working horses; they need grain as well. Mouldy or inferior hay should never be used. Oats, whole or bruised, was in his opinion, the best grain for working horses; wheat may be given occasionally, but it is not so easy of digestion as oats. Horses at work should have water at least three times a day. Most horses prefer soft muddy water to clean hard water. Give a generous supply before feeding. A sudden change of water will often cause colic; it is a good plan to mix a little oatmeal or bran with strange water for horses. The system followed by himself for twenty years was to give a short feed of chaff and crushed oats—about 6 lb. of each—at 5 a.m., 8 lb. chaff and 6 lb. crushed oats at noon, and 25 to 30 lb. soft hay over night. He always found his horses able to do a good day's work on this feeding, and he had not had a horse seriously ill during tilling and harvesting operations. If the hay is coarse it would be better to chaff it ½ in. or ⅝ in. for feeding at night. By no means least in importance was the currycomb; handle it freely, and brush well each horse daily. Considerable discussion followed. One member objected to the grain being allowed to develop too much before cutting the crop for hay, as the grain would not make up for what was lost in the quality of the straw, which became hard and fibrous. Besides, wheat was not the best of grains for horses.

Sand in Horses.—Mr. Jaensch stated that a bottle of strong coffee, with milk and sugar in it, would be found a good remedy for sand in horses.

Lucindale, May 16.

Present—Messrs. Feuerheerdt (chair), Carmichael, Dow, Matheson, and Dutton (Hon. Sec.).

Magill Boys' Reformatory.—Mr. E. E. Feuerheerdt read a very interesting account of a visit to the Reformatory School for Boys at Magill. He was particularly pleased with the orderly way in which the place was kept, and the methods adopted to educate the boys. Not only was there a vegetable garden and well-kept orchard on the estate, but well-bred cows, poultry, and pigs are kept. A carpenter's shop is provided, all the housework is done by the boys, and every boy must go through the regular State school education course. He came to the conclusion that every endeavour was made to make the boys useful members of society, and in fact most of the boys are better fitted to start life than many city or country lads, as they receive a thorough grounding in many useful occupations.

Cradock, May 9.

Present—Messrs. Ruddock (chair), Gillick, Solly, Turner, Graham, Lindo (Hon. Sec.), and one visitor.

Season.—The Secretary explained that no meetings had been held for some time on account of the drought. The recent change had, however, given them encouragement to go on with their work again.

Large and Small Wheat for Seed.—The Chairman read Dr. Cobb's summary of his experiments in this connection, and stated that he believed with Dr. Cobb that for practical purposes large, well-developed seed was most productive. Mr. Gillick instanced good returns from shrivelled grain, especially in 1868, after the rust. He thought a very great deal would depend upon local conditions. He strongly recommended securing seed from a distant locality every four or five years. Mr. Graham contended that it paid to clean wheat specially for seed; the refuse could be used on the farm. Members were unanimous in agreeing with the main conclusions arrived at by Dr. Cobb. Mr. Solly called attention to some of the seed being supplied this season to the northern farmers; it had apparently heated in the heaps before cleaning, and was discoloured and wilted. He would not have accepted some of it for seed purposes. Members agreed that such wheat was not suitable for seed.

Mundoora, May 8.

Present—Messrs. Harris (chair), Blake, Beck, Mildren, Aitchison, Shearer, and Gardiner (Hon. Sec.).

Euphorbia Drummondii.—The Secretary read letter from Department of Agriculture in reference to weeds sent down for naming. Referring to the so-called poisonous plant, Euphorbia Drummondii, the writer stated that, although the plant had undoubtedly been responsible for many deaths in large and small stock, it would appear to be mostly amongst travelling stock and animals which were not used to it, as there were authentic cases where sheep had been fed regularly on it without any injury resulting. Members generally agreed with this. The Chairman stated that he found it a safe practice to put his stock on to it as soon as it appears, as they then get accustomed to it before it becomes very plentiful. Mr. Blake stated that his cows had done well on the Euphorbia until the grass became plentiful.

Season.—Most of the members report having finished seeding operations, the early rains having put the land in first-class condition for tilling; hence this work has been completed earlier than usual. Some of the early sown crops are six inches high, and one member has turned his stock into a crop to graze it down; but the wheat continues to make good headway. This member finds the stock on the young green stuff have a greater relish than usual for salt, which is put where they can lick it when they choose. Another member had a paddock of green stuff (King's Early wheat) over 2 ft. 6 in. high at the end of April. Seed was sown in February.

Compressed Fodder.—A sample of this article, turned out by Messrs. J. Darling & Son at Gawler, was tabled by the Secretary. Members were much pleased with this, and desired to secure a ton or two for trial.

Stockport, May 11.

Present—Messrs. Watts (chair), Stribling, Godfree, Perry, Thomas, Howard, and Murray (Hon. Sec.).

Social.—The previous meeting, on April 6, took the form of a social, members bringing their wives and families with them. A lecturette by Mr. D. G. Stribling on his trip to Sydney was much appreciated. Songs, recitations, and music were given by various friends, and a very enjoyable evening spent.

Pickling Wheat.—It was agreed that 8 oz. bluestone to the bag of wheat was sufficient. Cold water was preferred for dissolving the bluestone.

Hawker, May 13.

Present—Messrs. Borgas (chair), Wardle, Hirsch, Dr. Shanahan, and Smith (Hon. Sec.).

Officers' Conference.—Members agreed with all suggestions from Officers' Conference, except in respect to doing away with postcard notices of meetings. They thought, however, the cost of postcards should be defrayed by the members, and that the amount now spent by the Department should be specially set aside for the purchase of seeds, &c., for experiments.

Season.—The Chairman regretted the poor attendance. They had not been able to hold any meetings for some time, as so many of the farmers had been compelled to remove their stock and seek employment for themselves in the more favoured districts. He hoped better seasons were in store for them; they had had splendid rains, but at the same time he considered the local correspondents of the Adelaide papers were not warranted in sending such glowing reports on the condition of the district, as they were misleading.

Adulterated Chaff.—Members were of opinion that action should be taken by the Government to prevent chaff merchants cutting up straw with hay and selling it as hay chaff. Members thought fraud of this character should be prohibited under a heavy penalty.

Horse Complaint.—Dr. Shanahan was thanked for the trouble he had taken to secure an investigation into the losses of horses that had occurred recently in the district. It was hoped that much good would result from the visit of the Inspectors of Stock and the Veterinary Surgeon.

Kapunda, May 2.

Present—Messrs. Shannon (chair), Teagle, Flavel, Patrick and Peter Kerin, Morris, O'Dea, Pascoe, O'Sullivan, and Harris (Hon. Sec.).

Euphorbia Drummondii.—Discussion took place in reference to alleged poisonous character of this weed, a letter being received from the Department of Agriculture stating that sheep had been fed in pens on the plant without injury.

Cattle Complaint.—Mr. Teagle stated that he had had more cattle affected, but they had recovered after receiving a much larger dose of the medicine mentioned at previous meeting.

Eudunda, May 11.

Present—Messrs. Gosling (chair), E. T., J. A., and J. Pfitzner, Martin, Weil Hucks, Krummel, Walter, and Marshall (Hon. Sec.).

Hay from Manured Land.—Discussion took place on the feeding value of chaffed hay grown on land manured with phosphates, members being of opinion that the manured hay was not so nutritious as hay from unmanured land, and was liable to cause purging. [This is quite contrary to general experience. Probably by far the greater proportion of the hay grown in South Australia during the past three years has been on manured land. The horses at Roseworthy College have enjoyed exceptionally good health during the past 11 years, and all that time they have had plenty of hay from manured land. —Ed.]

Improvement of Farm Implements.—The Hon. Secretary suggested that the branches of the Bureau should combine to offer prizes for working models of implements calculated to lessen the cost of production, models to be the work of apprentices only, and to be made in South Australia.

Wheat Experiments.—Mr. Walter reported sowing 17 oz. of Gamma wheat last year and reaping 62 lb. of good grain. Seed was drilled in with manure at rate of 56 lb. per acre, a mixture of two parts super and three parts bonedust being applied.

Burra, May 8.

Present—Messrs. McDonald (chair), Goodridge, Dawson, Duldig, Scott, Arnold Hawkes, Harvey (Hon. Sec.), and three visitors.

Water Conservation and Irrigation on the Farm.—Mr. W. G. Hawkes read a paper on this subject. He considered this matter of as great importance to Australia as to any other part of the world. In Australia they were always liable to prolonged periods of drought over large areas of country, and he believed that the future prosperity of the States would be governed by the amount of industry and intelligence brought to bear on the utilization of the water available. Water was the most scarce, and therefore the most valuable factor in the production of crops, and no one could deny that even in the driest of seasons copious supplies of water run to waste. He did not propose to deal with the question of water conservation on a large scale, but would refer to what the individual farmer can do. They had all more or less experience of the laborious undertaking of carting water, or of driving stock long distances to water in the summer, and the only way to avoid this was by sinking wells or constructing dams in suitable places. Some land, owing to its porous nature, is quite unsuitable for the making of dams; but their district, on the whole, was favourable to dammaking, and where it was not, water was most frequently obtainable by sinking. He would advise the construction of large dams, where there was good catchment and good holding ground. During the slack time of the year a farmer could, with his own teams and ploughs, excavate dams at a cost of about 3d. per cubic yard. At this price a dam, to hold 162,000 gallons, would cost £12 10/, and provide an ample supply for all the stock carried on an ordinary farm. Apart from the requirements of live stock, in suitable gullies, larger dams can be made, and the water used for irrigation. An excavation of 5,000 cubic yards would, with the water held back by the bank of soil taken out, conserve 1,250,000 gallons, or sufficient to cover five acres of land to a depth of eleven inches; or, to put it in another way, would suffice to give two inches each month for five months. To enable the stockowner to grasp what such a supply would mean, he could not do better than quote the results of an experiment carried out at Jemalong, New South Wales, by Mr. Gatenby, a large sheepowner. Under the supervision of a Government stock inspector, 1,685 sheep were fed for four months on the lucerne cut from a paddock of 22½ acres. The lucerne was cut every five weeks, and frequently as much as 10 tons to 12 tons per acre of green food was cut. This represents equal to 75 sheep per acre being fed during the summer on irrigated lucerne. Even if the farmer could only irrigate one acre of lucerne it would be of immense value to him. Eight tons of green feed per month could be very profitably fed to stock. The question of distribution would not present any serious difficulty. A pipe let into the base of the bank will distribute all above the ground level by gravitation, and there were plenty of cheap and effective contrivances for raising the water from the excavation. He was firmly convinced that there were great possibilties in this direction.

Redhill, May 5.

Present—Messrs. Ladyman (chair), Robertson, Lithgow, Stone, Wheaton, Kelly, McDonald, Lithgow (Hon. Sec.), and one visitor.

Preserving Leather Harness.—Mr. Stone read a paper on this subject. Before oiling or polishing harness it should be thoroughly cleaned; if well washed and dried the leather will soften, and oil or grease properly applied will keep it soft. Farm harness should be well cleaned and oiled twice a year to preserve it against heat and dryness in summer and wet in winter. Tallow is the cheapest, if not the best, grease for farm harness; it should be applied hot, and there will be no trouble about the grease coming off on the hands or clothes. Neatsfoot oil added to the tallow will prevent it hardening so rapidly in the winter. For buggy and light harness he generally used harness polish, as the dust clung to neatsfoot oil. He had used vacuum oil, but it required to be used often and lightly. Success will mostly depend upon the cleaning of the harness and the manner in which the oil or grease is applied.

Clarendon, May 11.

Present—Messrs. Juers (chair), Harper, Piggott, Dunmill, Spencer, Pelling, Phelps, Brooks, Morphett, and Wright (Hon. Sec.).

Officers' Conference.—Circular from Secretary for Agriculture was discussed, and it was decided to accept the resolutions from the Officers' Conference as rules of this branch.

Small Holdings.—Mr. A. Phelps read a paper on the utilization of small holdings. Most of the farms in the locality were small, averaging from 150 acres to 200 acres. The district being naturally adapted for dairy pursuits, dairying must be the first consideration. A good deal of care and thought will be required to achieve success. Proper yards and shelter are necessary, and green food must be grown for feeding when the grass is dry. Rape or mustard could be broadcasted when digging the potatoes or soon afterwards. Peas scarified in would produce good feed. Barley should be sown after the first rains, and maize in the spring for summer feed. Some dry feed will be necessary, and pea straw will be found very useful, if well harvested in the autumn. Loose hay as the winter approaches, and later on good chaff will be required. Mangolds and turnips should be grown and pulped before feeding. A dairy of 14 or 15 cows should bring in £70 per annum for milk. Sheep were also very profitable in this locality; on the stubble they will help to clean and manure the land. Small paddocks will be required for profitable working. The merino would, on the whole, suit them best. They were quiet, produce the best wool, and are good mutton sheep. Crossing with Shropshire ram should pay. A good paddock of feed should be reserved for the ewes when lambing. Early lambs will command the best price, and, with careful management of the pasture, they should be able to rear good early lambs here. They could keep up to 150 sheep, which, with the lambs, should return at least £75 per annum. Pigs and poultry combined with the dairy, and various marketable products, to be raised in the gully flats, will enable the holder to earn a fair income.

Hartley, May 8.

Present—Messrs. Klenke (chair), T. and J. Jaensch, W. and C. Brook, and Windersitz (Hon. Sec.).

Hand Separators.—Discussion took place on use of hand separators on the farm in preference to sending the milk to the factory. It was agreed that for those living near it was best to patronise the factory, but the hand separator was more profitable to those living at a distance. Where the factory is so situated that a man with a van could collect the cans from the different suppliers, deliver them to the factory, and bring back the empty cans at a small charge the factory should be supported.

Binder v. Stripper.—Two samples of oats were tabled—one stripped in the ordinary way, and the other from crop cut with the binder and after headed; the latter was threshed much better than the former.

Cherry Gardens, May 12.

Present—Messrs. Woods (chair), Jacobs, T. and C. Lewis, Potter, Wright, Burpee, Hicks, Brumby, and Ricks (Hon. Sec.).

Cuzco Maize.—Members reported that this maize grew well, and would apparently be a valuable fodder. It would have to be planted early, or it would not produce any seed; one member thought he would get a few ripe seeds, but the others had none.

Worms in Pigs.—In reply to question, Mr. Jacobs advised giving a little ground areca nut in pollard after fasting the pig for 24 hours.

Sparrows.—During the year the branch has paid for 800 sparrow heads, and members thought that if all the branches would take similar action the pest would be very much reduced.

Koolunga, May 7.

Present—Messrs. Butcher (chair), Button, Shipway, Butterfield, Lawry, Jose, Burgess, Palmer, and Noack (Hon. Sec.).

Seeding.—Mr. Butterfield read a paper on this subject. Dealing with the preparation of the land for seeding, if it were well worked fallow, he would scarify it or run the cultivator over the land. If inclined to be too loose or rough, he would roll the ground, but not otherwise. No definite date for commencing seeding can be fixed; everything will depend upon the season. The worst time to sow is when the land is neither wet nor dry. To facilitate seeding he would advise drilling in manure alone on about 100 acres, broadcasting the seed, afterwards covering it by harrowing crossways with light harrows. It was not advisable to put in a larger area this way, as, if rain comes before it is finished, the seed could not be put in quick enough for it to start ahead of any weeds in the soil. If the weather should keep dry there is less danger of the broadcasted seed malting, as it is put in shallower than drilled seed. Taking the experience of a number of years, he would not care to commence seeding before the middle of April in this locality, as seed sown earlier, when the weather and the soil are drier and warmer, is more likely to malt. He would rather prefer to finish as late as the first week in June than to commence earlier than stated. The depth to sow will depend upon the state of the land, and also the class of soil. Altogether he preferred shallow drilling. He would sow first of all the late rust-liable wheats, then the late rust-resistant varieties, and last of all early maturing kinds. For the early wheat 50 ℔. to 55 ℔. per acre should be sown, while 45 ℔. of the late stooling varieties will be sufficient. He preferred a pickle on a ground floor, using 8 oz. bluestone to the bag, and turning the wheat several times to secure that all the grain is pickled. Being a rather dry locality, he would not recommend putting more than 70 ℔. of manure per acre; he would manure all the crop, even if he had to put as little as 40 ℔. per acre. In a dry season the farmer could not afford the risk of putting on a heavy dressing of manure and then getting little or no crop. In a good season he had seen up to 30 bushels of wheat per acre reaped from land receiving only 56 ℔. of super per acre. Considerable discussion ensued; members generally were of opinion that too much manure could hardly be applied. Drilling in the manure and broadcasting the seed were advocated for crops intended for hay. One member referred to the scarcity of wild oats, but members were of opinion that there were plenty of oat seeds in the ground, which would germinate in the first good season.

Whyte-Yarcowie, May 16.

Present—Messrs. Hack (chair), Hunt, Hatherley, Faul, Mudge, and Boerke (Hon. Sec.).

Feeding Value of Manured Hay.—Members disagreed with opinion of Eudunda Branch that hay from land manured with superphosphate was not so nutritious as hay from unmanured land. Chaffed hay from manured land has been used regularly in this district for some time past without causing any ill-effect on stock.

Cultivator v. Scarifier.—Mr. Hunt stated that he had been using a cultivator for about a year, and was greatly pleased with it. In his opinion it was superior to the scarifier; with the same power he could get over 16 acres with the cultivator, as compared with 11 acres with the scarifier, in a day. The former kills the weeds better, enters hard soil, and loosens the ground better, doing, in fact, the work of scarifier and harrows combined.

Molasses for Stock.—The feeding value of molasses for stock is admitted, but members thought farmers were not generally aware that if good straw is sprinkled with molasses and water as it is being stacked it has a very high feeding value. One pound of molasses should be dissolved in a gallon of warm water, and when stacking each layer of about 18 in. should be well sprinkled with the solution.

Crystal Brook, May 9.

Present—Messrs R. Pavy (chair), P. Pavy, W. and A. Hamlyn, Davidson, Venning, Townsend, Miell, Hutchisson, Weston, Dabinett, and Symons (Hon. Sec.).

Conference Report—Regret was expressed at the delay in publication of report of Northern Conference. Members were of opinion that the papers, &c., had been so abbreviated as to greatly depreciate their value.

Lucerne.—Mr. Davidson read a paper on this subject. From his own experience he was convinced that lucerne was one of the best plants they could grow, especially on good soil subject to flooding. Thorough preparation of the land for seeding was essential; plough early, and keep the ground well worked, to get a fine tilth. The land should be firm beneath. Seed should be sown here about the end of July or beginning of August. He had broadcasted seed with the seedsower, and then rolled and got a good stand; latterly, however, he had drilled in the seed, using 10 ℔. per acre, and applied about 40 ℔. of super; this answered splendidly. Care must be taken not to bury the seeds too deeply. He had tried sowing lucerne seed with other grain, but with poor success. The young plant should not be grazed; when it shows for flower cut it with the machine in preference to grazing. The second season stock can be put on the lucerne without injury; his system was to feed it bare and then remove all stock until it has made good growth again. To do this properly it is necessary to have several small paddocks. Lucerne hay properly cured makes splendid winter feed for cows.

Mount Remarkable, May 9.

Present—Messrs. Jorgensen (chair), Challenger, T. P. and G. P. Yates, Foot McIntosh, Morrell, Casley, and O'Connell (Hon. Sec.).

Sheep.—Mr. McIntosh read a paper on this subject, dealing with sheep suitable for small holding in this locality. As farmers' sheep were fed to a large extent on the fallows, meat production must take precedence of wool, though every effort should be made to produce wool of as high standard as possible. It was absolutely necessary to secure the best rams that the farmer's finances will permit. Keep the large ewes for breeding, and only purchase big-framed rams. Remember, that the better the sheep are fed the higher will be the returns. Great care must be exercised that more sheep than there is good feed and water for are not kept. Always keep salt in the paddocks. He believed the Lincoln and Shropshire would pay the farmer best; they possess large frame and the lambs mature early. Lincolns have a bad name as wanderers, but he thought this due to the quality of the feed in the paddocks; if there is something better next door they can hardly be blamed for crossing over for it. Culling must be practised to keep up the standard of the flock; every ewe that will not rear a lamb and carry a good fleece of wool—as much on the belly as on the back—should be got rid of. In Lincolns no lambs with black spots, brown ears and legs, should be kept for breeding. A good Lincoln ewe will often rear two lambs and carry a good fleece at the same time; she also fattens when most breeds will nearly starve. The rams should be kept in good condition when serving the ewes; yard the ewes at night, and keep the rams separate. It is advisable to shear the rams at least six weeks before they are put with the breeding flock. For crossing he preferred merino rams with Lincoln ewes, the Shropshire cross, while producing fine meat sheep, is not always profitable as a wool producer. Shearing must be carefully done, the yards and floor kept clean, and the wool made up into as few classes as possible. In yarding he found it handy to use stakes with wire netting, as the yard can then be easily shifted every two or three days. All sheepskins should be dried in a shady place; hang them over a rail in the position they come off the sheep. Be careful to protect them from weevil, and send them to market at first opportunity. Mr. Challenger said sheep were said to clean the land, but if they are well fed they will not do much in this way.

Port Elliot, May 16.

Present—Messrs. McLeod (chair), Green, Williamson, Pannel, Inglis, W. E. and W. W. Hargreaves (Hon. Sec.), and H. Welch (of Port Pirie Branch).

Adulteration of Chaff.—Members strongly condemn the practice of some merchants of chaffing up straw with hay, and selling it as hay chaff.

Conservation of Water.—The Chairman thought farmers in the hills might conserve a lot of water that now went to waste in winter for irrigation in summer. By the aid of irrigation it should be possible for them to carry three times as much stock as they did now.

Broadcasting or Drilling Manure.—This question was discussed. Members favoured the use of the drill, as it distributed both seed and manure more evenly; 60 lb. of wheat or oats per acre was considered about the right quantity to sow in this district.

Farming.—Mr. Inglis read a short paper on "A Few Remarks on Farming." He did not think it was possible that the multiple-furrow plough did as good work in turning and breaking the soil as the single-furrow, though he admitted that, with the short season available for the preparation of the land, the double or three furrow ploughs were boons in ploughing; the depth must be regulated by the character of the subsoil and the depth of the surface soil; he found land ploughed 4 in. to 6 in. deep produced satisfactory results. Seed should be got in as early as possible, so that the plant was strong before the cold weather set in. He found Algerian oats to suit his land better than any other cereal he had tried; wheats of various kinds had been sown at different times with poor results. Last year he sowed Cape barley in July, and got 16 bushels per acre; Algerian oats sown about the end of June gave six bags per acre.

Balaklava, May 9.

Present—Messrs. Anderson (chair), Reid, Tiller, Hains, Burdon, Johnson, and Black (Hon. Sec.).

Driving Light Horses.—Mr. Tiller read a paper on riding and driving light horses. The way a horse carries himself in harness will depend largely upon the rider or driver. The horse must be properly mouthed, as control of the head must be secured first. Patience and gentleness are most important in handling horses. Always speak in a quiet but firm tone. Never continue efforts to educate the animal when it shows signs of weariness. In teaching him to walk he should be given a mile or two of exercise, well held in, and not allowed to jog or break. In teaching him to trot, start slowly, increasing the speed gradually, but always keeping him in reserve a little. Never gallop the animal. When the horse has taken kindly to saddle work break him to harness work. When used to the harness put him alongside a quiet horse on the outrigger. Start quietly, and walk some distance to allow him to get used to his work. Never allow the horse to rush off at the start. Some discussion ensued, members generally endorsing the paper.

Dowlingville, May 8.

Present—Messrs. Illman (chair), Mason, Montgomery, Whittaker, Graves, Phelps, Tee, and Lock (Hon. Sec.).

Fallowing v. Change of Crop.—Discussion took place on the question of whether it was more profitable to rest the land or to grow some different kind of crop on it. Members were generally of opinion that in this district the best practice was to fallow the land, take off one crop, and rest it the next year.

Harrowing Growing Crop.—This subject was also discussed. Several members mentioned favourable results from harrowing the growing crop, and it was resolved that, in the opinion of this branch, it was beneficial to roll the growing crop, and then run light harrows over it.

Bowhill, May 9.

Present—Messrs. Norman (chair), Johnson, Weyland, Tyler, Burton, Whitfield (Hon. Sec.), and one visitor.

Destruction of Rabbits.—In reply to question, members were of opinion that the distribution of phosphorized pollard was the most effective way of dealing with the rabbits at this season of the year.

Angaston, May 9.

Present—Messrs W. Sibley (chair), Friend, Thorne, Snell, Rundle, Player, Radford, A. and F Salter, A. Sibley, and Matthews (Hon. Sec.).

Lucerne as Green Manure.—Mr. Rundle strongly advocated the ploughing under of lucerne. He instanced very heavy yields of wheat on land that had grown lucerne compared with land alongside One three-year-old lucerne patch, on being ploughed up and cropped, yielded 37 bushels per acre, against 18 bushels from land alongside.

Ensilage.—Mr. A. Smith read a paper on ensilage. Far too little attention was paid to ensilage, which had been proved to be one of the best of foods for dairy stock in summer. Unlike summer green crops, which, owing to our dry seasons, were very uncertain, crops for ensilage can be grown with certainty in almost any part of the lower north and south. Almost any kind of green stuff that stock will eat may be converted into ensilage. Maize is, perhaps, best of all, but lucerne, peas, sorghum, cereals, &c., are all valuable The cereal crops that are dirty with weeds should be converted into ensilage; even the weeds about the farm are useful. A mixture of plants was better than one kind alone Special crops should be sown for cutting for ensilage, the land being first heavily dressed with whatever farmyard manure is available. A good mixture to sow would be, per acre, 15 lb. strong-growing wheat, ¼ lb. rape, 10 lb. rye, 20 lb. peas or vetches, and 40 lb oats. Maize must be chaffed into the pit; in fact, all green is best treated in this way. If cut with the binder, chaffing is absolutely necessary. He thought the overground silo preferable to the pit, as it was more convenient and entailed less labour. Good stone or bricks were best for building, but slate or good slabs will do well. Cut the crop as soon as it reaches the dough stage; if earlier the ensilage will be likely to cause scouring, while if left too late it contains less nutriment, and more indigestible matter. Mostly the crop is allowed to wilt a little before being carted to the silo; but two seasons ago, at Roseworthy, the stuff was carted as quickly as it was cut, and during some of the time it was actually raining; yet it turned out as good as any he had seen at the College. The crop contained a very large proportion of poppies, the worst-infested patches being cut. [The cattle, however, rejected the poppies when the ensilage was fed to them—Ed.] In filling the silo spread the green stuff evenly, and keep it well tramped down. When full add weight, putting in fresh green stuff as the mass sinks. If the temperature rises too quickly add more weight, as excess of heat will cause charring and discoloration. Discussion followed The Hon. Secretary stated that he had had experience with two different silos. The first was an earth silo, 12 ft. x 12 ft. x 12 ft, in two divisions. Lucerne, oats, barley, and rye were put into the pit, but through overheating the silage was very sour, and the stench almost unbearable when it was opened. Notwithstanding this the horses eat it with relish, and every particle of the ensilage was consumed This was on the late Mr. Duffield's Para Para Estate. The other silo, belonging to the late Hon. Jno. Martin, was walled and cemented, with sliding galvanized-iron doors, under a large shed. Oil drums cut in half and filled with concrete, with an iron ring partly embedded in it, were used for weights. The ensilage was made of weeds, such as thistles, "dandelion," artichoke, &c., and it turned out quite sweet and dry. Horses and cattle both relished it; fed to the dairy cows during late summer and autumn there was a decided increase in the milk supply.

Bute, May 12.

Present—Messrs. Brideson (chair), Hamdorf, Sharman, Stevens, Ebsary, Masters, Schroeter, Barnes, Cousins, Trengove, and one visitor.

Hon. Secretary.—Mr. S. Trengove was appointed Hon. Secretary, in place of Mr. A. Sharman, who tendered his resignation.

Selection of Seed Wheat.—The Hon. Secretary read abstract from Dr. N. A. Cobb's report on experiments to determine the relative values of different grades of seed wheat, the results of five years' careful testing showing that the crop from the large, plump seed yielded more grain and straw, and the grain was heavier, than yielded by the crop from small seed. Members spoke very highly of the practical nature and value of the experiments carried out by Dr. Cobb. The question was asked—"How long does the plant continue to draw nourishment from the grain?" Mr. Ebsary stated that on digging up wheat plants six weeks after they had sprouted he found the attached grains still containing nutriment.

Lucerne.—Several members reported that lucerne had done well in the district this year. Mr. Ebsary called attention to report from Victoria that wheat on land that had been in lucerne yielded 25 bushels per acre, compared with 10 bushels from land alongside.

Morgan, May 9.

Present—Messrs. Windebank (chair), Bruhn, Hausler, Hahn, Haupt, H. and R. Wohling, Plummer (Hon. Sec.), and two visitors.

Dairying.—Discussion ensued as to the best season of the year for the cows to come in, and it was resolved that in this district it was best to have the cows on the highlands calve in March or April, but for the lowlands along the river, February or March would be more suitable. The Hon. Secretary initiated a discussion on the extension of the dairying industry in this district. The Morgan storekeepers frequently sent to Adelaide for supplies of butter, which were sold locally at considerably enhanced rates. Both of the visitors thought that with a return of good seasons, and with present facilities for storing butter when it was cheap, until prices rose, it was not likely that high prices would prevail for any length of time. Mr. Hahn pointed out that settlers on the river could go in for dairying, as they could grow lucerne, maize, and sorghum; probably it would pay best to put the maize and sorghum down as ensilage. It was resolved that it would pay to go in more for dairying on the river.

Willunga, May 2.

Present—Messrs. Pengilly (chair), Richards, Valentine, Atkinson, Malpas, Blacker, Kernich, and Hughes (Hon. Sec.).

Cuzco Maize.—Members reported that although the plants of Cuzco maize grew strong thick stalks, in every case they failed to set any grain.

English v. Cape Barley.—An interesting discussion took place as to which was the more profitable to grow. Taken one year with another, English barley was considered to be more profitable, but only in limited areas, as the demand was not large enough. Cape barley gave heavier yields, but the price was lower, the straw was not so good, and it appeared to take more out of the land. It was stated that a farmer who cut English barley for hay found his horses never looked better than when fed on it. Members expressed indignation at what they considered unfair treatment on the part of the buyers of barley this year, the tactics of certain individuals being very strongly condemned. Hanna barley is becomng very popular in this district; it is early, yields well, and most of the awns drop off as it becomes ripe.

Headed Straw Chaff.—Members considered this useless for working horses, unless mixed with a liberal supply of corn. It would, however, do for young stock in winter.

Wandearah, May 11.

Present—Messrs. Robertson (chair), Halliday, Munday, Birks, Fuller, Dick, W. and R. Roberts, Davidson, E. H. and E. J. Eagle (Hon. Sec.).

Fresh v. Rotted Farmyard Manure.—Discussion took place on Professor Towar's recommendation to cart out and spread the farmyard manure as fresh as possible. Members had always thought it best to rot the manure first, and did not know how fresh manure would act in this country; spreading it fresh would undoubtedly save a lot of labour. Discussion also took place as to best time to apply the manure. It was agreed that it should be spread just before fallowing, and then turned under so that it will become completely incorporated with the soil. The weed seeds would then germinate and could be destroyed, while there was less danger of the crop on the fallow next season being blighted by hot winds than would be the case if the manure were applied shortly before seeding.

Stallion Tax.—Opinion differed on this subject, some members considering that it was just as necessary to reject unsound mares as stallions. It was also thought that owners of first-class stallions should refuse to accept unsuitable mares. A motion in favour of the stallion tax was lost.

Millicent, May 7.

Present—Messrs. Campbell (chair), Stewart, Holzgrefe, Crouch, Oberlander Holzgrefe, McRostie, Davidson, Warland, Hart, and Harris (Hon. Sec.).

Business.—Mr. Stewart tabled fruit of persimmon or Japanese date plum grown at Rendelsham, also Cuzco maize 12 feet in height, with immature cobs; there was no probability of any of the latter ripening. The Hon. Secretary tabled fruits of tomato from seed raised in New Zealand; fruits of good quality. Mr. Hart stated that he had tried growing tomatoes on netting as recommended in The Journal, but the plants trailing on the ground fruited better.

Holstein Cattle.—Mr. Holzgrefe stated that he had sent to the Adelaide market some crossbred three-year-old steers, the progeny of the Holstein bull loaned to the branch some years ago; these realized £15 2/6 per head, and two-year heifers fetched £10.

Potatoes for Dairy Cows.—Mr. Holzgrefe expressed surprise that, with potatoes so cheap, the growers, instead of glutting the market, did not use them for stock feed. He had fed a lot to his cows this season, and found it a profitable way to utilize them. Milk cows especially made good use of them. When the distillery was working at Mount Gambier it used to be the practice to fatten old cattle on the waste potatoes.

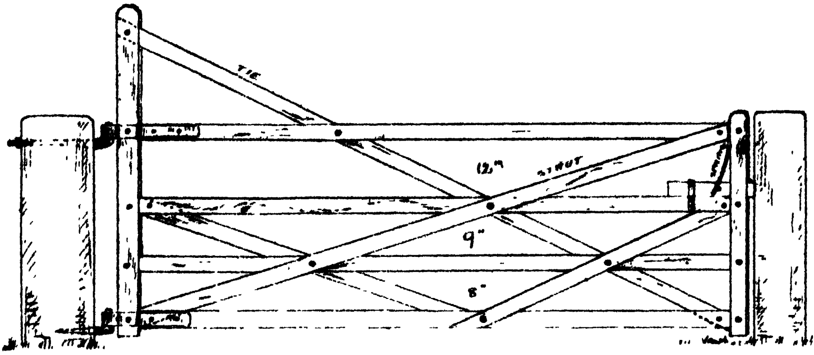
Saddleworth, May 16.

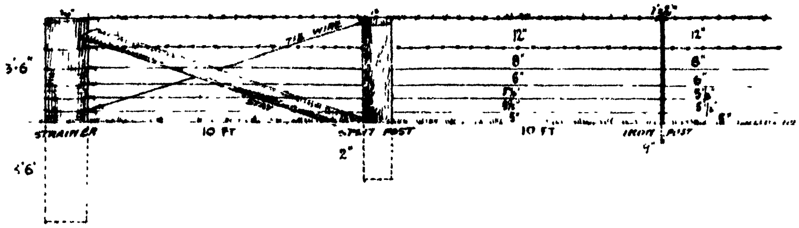
Present—Messrs. Frost (chair), Adams, Daley, Eckermann, Hannaford, Heaslip, Scales, and Coleman (Hon. Sec.).

Treeplanting on Bay of Biscay Land.—In reply to enquiry, the Conservator of Forests wrote that he could hardly recommend treeplanting on Bay of Biscay lands; pines would not thrive, but possibly the peppermint gum and two varieties of sheaoak might succeed. Members thought that if the surface was kept loose to prevent the soil cracking the trees might succeed, but the red patches found through the Biscay land offered better prospects for the trees.

Farm Improvements.—The Hon. Secretary directed attention to a large home-made wooden gate, and furnished the following particulars of its construction:—

Length, 11 ft.; height, 3 ft. 6 in.; heel post, 5 ft. 9 in.; head post, 3 ft. 9 in. Construction.—Heel post, 4 in. x 1 in., V.D.L. hardwood; rest of gate, 3 in. x 1 in. hardwood. The heel and head posts are double the four horizontal bars, and tie piece slip between them, and bolt passed through and secured tight. It is very necessary to see that all ties and struts fit close against the upright heel and head pieces. Advantages over common gates of wood.—Top rail is much strengthened by tie piece bolted at one-third its length from heel post. The extra bracing at outer bottom corner strengthens the weakest place in a field gate. This gate will not sag, but yet give to side pressure without breaking, if painted at once the timber shows no sign of twisting. Wood required, 100 ft., allowing for a little waste, and 22 bolts (8 in. x ⅜ in. and 2 in. x ¼ in.). The system of triangles renders gate strong and yet light and sheepproof. Mr. Coleman also showed diagram of six-wire fence.





Corner Strainers.—7 ft., half in ground; 1 ft. 6 in. to 2 ft. or more in diameter. Strainers in line of fence about five chains apart, 6 ft. long, 3 ft. 6 in. out of ground, 10 in. diam. Split posts, 5 ft. 6 in. x 22 in. round, and not less than 4 in. through; 2 in. in ground; placed 20 ft. apart, bored with six holes, viz.:—5 in. from ground, then 5½ in., 5¼ in., 6 in., 8 in., and 10 in.; the top hole for short wire to tie down, 12 x 2 barb on top. The second hole is ¼ in. for a short barb 12 x 3 wire to pass through; rest ⅜ in. holes. Stay post between strainer and foot of first post. No stays to line strainers. Tie wire from top first post to bottom hole in end strainer, outside of stay. Iron posts, 4 ft. 1 in. long, 1 in. x ¼ in., 9 in. in ground. Plain wires pass through the posts, barb wires tied with thin wire. These posts have a notch cut at top, and hole an inch below for wire to tie barb down. Alternate with wooden posts. Wire.—Top two are 12 x 3 barb, the lower has short barbs; rest, No. 8 steel. Local cost.—Corner strainers, 5/ to 7/6; line strainers, 2/6; split posts, £3 per 100; iron posts, 33/ per 100 (30/6 Adelaide). Erection.—Split posts including iron posts and drawing in and straining wires, 7d. per post; line strainers, 1/2; corner strainers, 2/6, including stay and tie wire. [We agree that the above forms an excellent fence. We, however, fail to see the necessity of two barbs. We would suggest that the "staying" would be cheaper were the first post 7 ft. from the strainer. We would place posts 30 ft. apart, using two intervening iron posts instead of one.—Ed.]

Feeding Horses.—Several members feed all chaffed hay with a little bran and oats; others give long hay at night. The latter practice was objected to, as allowing but little time for the horses to lie down and rest; 30 lb. of chaff per day was considered ample for a horse.

Agricultural Education.—The teaching of agriculture in State schools, especially outdoor practical work, was favoured, and the local schoolmaster encouraged to continue his work in this direction. The teaching of the science of agriculture in local institutes for the benefit of farmers was discussed, but members feared that farmers generally would not be able to avail themselves of such classes.

Specialization in Farmers.—Paper read at Crystal Brook Conference was discussed. Members did not agree with Mr. Wilson's arguments in favour of specialization, but held that where the district and holdings are favourable general farming was the better practice. Dairying, pigs, poultry, and, on the large farms, sheep, were of great assistance to the farmer.

Foreign Seeds in Manure Bags.—Attention was called by several members to the presence of foreign seeds, especially barley, in manure bags. The presence of any kinds of seed in manure bags was considered very objectionable. [I am afraid the cutting of prices for manure is the cause of secondhand bags being used to hold the manure.—Ed.]

Minlaton, May 2.

Present—Messrs. Brown (chair), H. and J. Martin, Correll, Teichelmann, Mayor, and McKenzie (Hon. Sec.).

Sheep for Farmers.—A long discussion took place on paper read at previous meeting by Mr. H. Boundy, on—"How to Make Sheepfarming Profitable." Several members held that the Merino was the best all-round sheep for farmers, and most profitable as wool producers. A resolution that in the opinion of this meeting, breeding lambs for market would only pay in this district under favourable circumstances was carried.

Johnsburg, May 9.

Present—Messrs. Potter (chair), Hombsch, Chalmers, Luckraft, and Redden.

Poisonous Weed.—Some discussion took place on alleged poisonous properties of Lotus australi, several horses having been reported to have been poisoned by it. Members were divided in their opinions as to whether death was due to poison or to bloat, as suggested by the department. The Chief Inspector of Stock recommended that directly any animal appeared to be affected by partaking of supposed injurious plants, a strong purgative should be given, followed by liberal doses of linseed oil.

Bureau Work.—Owing to the drought the work of the branch has been considerably interfered with, and difficulty has been experienced in securing attendance of members. It was decided, however, to enforce the rule re non-attendance. Members reported that the season had opened very favourably, splendid soaking rains having been experienced. Feed was getting abundant, and the early sown wheat was beginning to cover the ground.

* * *

VENTILATION OF FACTORIES AND WORKROOMS.

CONTRIBUTED BY THE CHIEF INSPECTOR OF FACTORIES.

(Continued from page 647.)

III.—ORDINARY DUST FROM FLOORS.

In calculating the probable effect of combustion of gas on the purity of the air of a room it is evidently necessary to consider to what extent the arrangements for ventilation permit the heated air from gas jets to escape without vitiating the air at the breathing level. In high rooms the air at the breathing level will be less vitiated than in low rooms. In rooms such as weaving sheds, where the driving belts for machinery are constantly mixing the air at different levels, or where the incoming air is introduced at a high level, there will naturally be more complete mixture than in other rooms, so that more fresh air will be needed to keep the air at the breathing level reasonably pure. In the weaving shed, Table P, Appendix 1, with 2 1-3 gas jets per person, the excess of carbonic acid rose from 3 to 12 when the gas was lit.

When two or more floors are in communication by stairs, lifts, or other communications the effects on the upper rooms of gas burning in the rooms below must also be taken into consideration, as the vitiated air will all pass upwards, as is shown by a number of the analyses in Appendix 1. When the building is warmer than the outside air the vitiated air will ascend, whether it be produced by gas or by respiration. Thus in Nos. 7 to 10, Table 1 (Printing), the air in the top floor contained an excess of 21 volumes of carbonic acid, but in the basement of only 6.6 volumes, while the air entering the top floor by the shaft of the lift contained 13 volumes in excess. Hardly any gas was burning. In Nos. 15 and 16 of the same table the excess in the air entering by the stairs was 10.3 volumes, and in the room itself 15.3 volumes. In Nos. 17 to 19 the excess in the first floor was 3.3; in the second floor, 5.8; and in an empty upper floor, with no persons or gas jets, 7.5. In Nos. 1 to 3, Table K, the excess was 12 in the room itself, and 9.3 in the air coming up through a grid below. Other similar instances will be noticed in Table A and elsewhere; and it will also be seen that in basement rooms the air was usually found to be relatively pure. Frequently the basement and ground floor rooms act as intakes for the whole building.

The air of all factories and workshops, whether or not the process is a dusty one, is necessarily contaminated to some extent with light dust from the floors, &c., the amount depending on the cleanliness of the room. This dust originates partly from the clothes and persons of those who are or have been present in the room, and is thus liable to contain infective micro-organisms. Some idea of the manner in which such organic dust accumulates in a room may be formed from determinations of the number of bacteria of all kinds present in the air, and the following average results may be quoted here in illustration. The outside air (winter) contained an average of 0.8 micro-organisms per litre.

		Micro-organisms per litre of air.
Elementary schools in Dundee with natural ventilation	Cleaner	91
	Average	125
	Dirtier	198
Elementary schools in Dundee with natural ventilation	Opened over 20 years ...	311
	Opened 2 years to 20 years	250
	Opened less than 2 years	38
One-roomed dwellings in Dundee ..	Cleaner	18
	Average	45
	Dirtier	93
Two-roomed dwellings in Dundee ..	Cleaner	10
	Average	22
	Dirtier	69

A number of determinations of bacteria in workrooms were made by the Committee (see Appendix 1). It soon, however, became evident that the results were so much influenced by the nature of the dust peculiar to the work that they were of limited value. Very little significance can be attached to the presence of even large numbers of bacteria in the air if these bacteria are derived from material which is not likely to contain germs of disease. Thus the largest number of bacteria found (805 per litre) in the samples of air examined was in a rope factory, and there seemed no reason to suspect that these bacteria, which evidently came from the hemp, contained among them any that were not perfectly harmless. On the whole the 39 analyses made (chiefly among printers, bookbinders, tailors, and milliners' workrooms) indicated a satisfactory standard of cleanliness in most of the rooms examined. The average number found (excluding the rope factory results) was 8.0 bacteria and 2.2 moulds, or 10.2 micro-organisms per litre of air. This may be compared with the averages of 152 for elementary schools in Dundee, 76 for country board schools in Scotland, 60 for one-roomed dwellings, 46 for two-roomed dwellings, 9 for the better classes of dwellings, and 0.8 for outside air in Dundee in winter. The figures given above show the close connection which exists between general cleanliness of a room and the purity of the air. Of particular importance in this reference is the prevention of expectoration on the floors, on account specially of the readiness with which infected persons may probably communicate phthisis by this means. Many employers have already taken special measures to prevent expectoration on the floors of their workshops; and it is to be hoped that this example will soon be universally followed.

(To be continued.)

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of persons registered and found employment by Government Departments and Private Employers from April 28 *to May* 29, 1903.

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths	101	59	199
Carpenters	4	—	4
Masons	—	3	5
Blacksmiths and strikers	1	3	2
Boilermakers and assistants	1	—	—
Caulkers	1	—	—
Fitters and turners	1	—	1
Painters	5	—	2
Fencers	—	—	3
Shipwright	—	1	—
Female attendant	—	—	1
Warder	1	—	—
Cook and scullerymen	—	—	2
Apprentices	2	3	—
Cleaners	2	6	—
Porters and junior porters	9	3	2
Rivet boys	—	—	—
Totals	128	78	221

May 29, 1903. A. Richardson, Bureau Clerk.

Printed by Hussey & Gillingham, 26 and 28, Waymouth Street, Adelaide.

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AND

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No. 12. JULY 1, 1903. Vol. VI.

ARSENICAL SPRAYING AGAINST CODLIN MOTH.

Report on Experimental Work for 1902-3.

By Geo. Quinn, Horticultural Instructor and Chief Inspector under the "Vine, Fruit, and Vegetable Protection Act, 1885."

Introductory to this report it should be mentioned that arsenical sprays have been used in a desultory manner against this pest for about 12 years in the orchards of South Australia.

By his advocacy, Mr. A. Molineux, the late General Secretary of the Agricultural Bureau, about 1891 succeeded in instituting a slight trial of the use of Paris green in water in the old pear orchard attached to the Hospital for the Insane on North terrace, Adelaide. No beneficial results being obtained, the subject appears to have lapsed merely into a newspaper advocacy by a few persons who had made themselves more or less acquainted with American experiments.

When the writer assumed active operations under the Vine, Fruit and Vegetable Protection Act in 1894 the control of this insect was deemed of growing importance. Stimulated by the reports of the American experimentalists, and urged on by Mr. Molineux, I persuaded the then Minister of Agriculture (Hon. Dr. Cockburn) to permit me to carry out a small test on condition that no expense outside ordinary office maintenance should be incurred. Up till this time, with one or two exceptions, the insect was practically confined to the suburban gardens on the plains around Adelaide. As the pippin fruits grown in them were not of much importance little interest centred in the work. The arsenical compounds then used in spraying mixtures were the arsenites of copper and lime, known by their common names of Paris green and London purple.

After a few enquiries an old garden, situated on Hackney road, owned by Mr. G. Nitschke, was kindly placed at my disposal. From this 24 old and large pear and apple trees were selected for the test. Messrs. Chapman and Dobbie, the pioneer makers of spraypumps here, promptly placed their best appliances at my disposal free of cost. On October 26, as soon as the petals had fallen from the flowers, the Paris green and London purple sprays were used on separate lots of trees. They were each used at the rate of 1 oz. in 12 gallons of limewater, made by slaking 1 lb. of fresh lime and afterwards diluting it with water in which 1 lb. of molasses had been dissolved. Twenty-one days later (on November 16) the second spraying was given. Until the middle of December the fruits on the sprayed trees appeared to be attacked less than those upon the unsprayed trees adjoining them. As the summer progressed, however, they all became infested alike, and no tangible result accrued from the year's work, beyond leaving a gleam of hope that continued treatment might contain a solution of the difficulty. At this time very little was known respecting the natural habits of the insect under the climatic conditions prevailing here. The available literature on the subject reiterated the now disproved theory that when the moth emerged from the chrysalis in the early spring it laid its eggs in the calyces of the flowers of the apple and pear trees, and the young larva when hatched ate directly into the fruit from its natal spot. The long drawn out period over which the winter-hybernated larvae emerged into the pupae and thence into the winged egg-laying insects had not then been established on the basis of a demonstrable fact.

During the following year a fresh supply of Paris green was procured, and five sprayings were given, with a regular interval of 14 days between each, to the same trees which had been treated in the Hackney garden during the previous season. The results as far as checking the attack of codlin moth was concerned, were absolutely nil. The work was done thoroughly, the fruits being well coated in the spraywash. Its negative value in preventing the codlin attack to my mind quite disproves the contention more recently raised by some persons to the effect that the presence of the limewash of the spray causes the egg-depositing moths to avoid the sprayed trees. During this season of failure many growers known to be careful observers reported the utter uselessness of three sprayings with Paris green as a preventive of codlin attack. With a view to settling one source of doubt the remainder of the parcel of Paris green used in my experiments was submitted to the Public Analyst, who, after careful testing, declared the compound to be quite destitute of arsenic. Analyses of all of the samples of so-called Paris green procurable in Adelaide were then made, and they were shown, with one exception, to be spurious compositions.

In the following year permission to use a block of trees in the orchard attached to the Parkside Lunatic Asylum was kindly granted by the Colonial Surgeon. With Paris green of attested purity seven sprayings—given at fortnightly intervals between each—were applied. As the season progressed the fruits on the sprayed trees showed a much lessened codlin attack than those untreated growing near by. In February the fruits were stripped from three trees and examined individually. The percentages of sound fruits upon them were 91 per cent., 95 per cent., and 97 per cent. respectively. Unfortunately a violent storm of hail and rain passed over the garden a week or two later and knocked the remaining fruits from sprayed and unsprayed trees alike into an inseparable mixture in the muddy soil. Although this experiment was robbed of its final value, the preventive nature of the arsenical spray was established in my mind.

With each succeeding year the codlin moth continued to extend its ravages into districts of greater importance in apple production. In 1897 the Minister of Agriculture (Hon. Dr. Cockburn) sanctioned the expenditure of £30 in continuing these spraying tests, and a block of trees was secured for treatment in the orchard of Mr. Arthur Quick, of Marion. This block, which contained 259 apple and pear trees, made up of 18 distinct varieties, was divided into sections. Some were sprayed with Paris green at the rate of 1 oz. in 10 gallons of lime water. Others were sprayed with the now well-known arsenite of soda in lime water compound put forward by Professor Kedzie, of Michigan, U.S.A., This latter formula had just come to the knowledge of the department, and was included in the test at the last moment, hence the limited number of trees treated with it. Between the sections treated with these arsenical compounds rows of untreated trees were retained as checks upon them. The sprayings as usual began with the fall of the petals, and continued at fortnightly intervals. Some sections received four, others five, and a few seven dressings. The fallen fruits were collected bi-weekly and examined individually. The bands around the trees were examined weekly and a record kept of caterpillars trapped therein. At the end of the test—which was conducted throughout a rainless summer—the following results were realized:—

17 rows sprayed with Paris green yielded 58,719 fruits, of which 6,012, or 10 per cent., were infested by codlin moth.

4 rows sprayed with Kedzie's formula bore 19,950 sound fruits and 1,127 infested, or a percentage of 5.3 infested.

4 rows unsprayed carried 13,601 fruits, of which 5,752, or 42.3 per cent., were infested.

A full report of this experiment was published in The Journal of Agriculture for June, 1898, and subsequently issued in pamphlet form. From this time onwards the officers of the department never ceased to urge apple growers to use arsenical sprays, more particularly Kedzie's formula on account of its cheapness, simplicity of manufacture, and freedom from adulteration. Such advocacy met with much distrust; both the effectiveness of the remedy and the possibility of applying it at a reasonable cost were openly questioned by many apple growers. In the meantime the codlin moth continued to extend its ravages, and the number who openly expressed the opinion that it was impossible to reduce its destructiveness increased. It is true a grower here and there braved the ridicule of his fellow-orchardists and started out to try the value of arsenical spraying, but if any persisted throughout a season no record has yet come to our knowledge.

In this manner several years passed, and the prospects of the once promising apple-growing industry were becoming distinctly gloomy. The renewal of hope came from an unexpected quarter in the shape of a letter contributed to the daily press by Dr. J. H. Henderson, of Crafers. In this he described what had been done with Kedzie's arsenical spray by Mr. George Sandow of Grunthal, who had been induced to treat a portion of his orchard on the lines indicated by the departmental report on the Marion experiments. At the same time Messrs. Laffer and Merchant, of Belair and Cherryville respectively, were working on similar lines and with equally gratifying results. Many persons of all shades of opinions visited these orchards, and numbers went away with the determination to do likewise. So convinced were many of the exporters and growers that in this remedy lay the redemption of the apple-growing industry of the State that they formed an influential deputation to the Minister of Agriculture (Hon. R. Butler) requesting that its value be demonstrated in all of the apple-growing districts of the State where the ravages of codlin moth were known. The Minister agreed to the suggestion, and an advertisement was inserted in the daily papers inviting apple growers to co-operate with the department by offering portions of their orchards for such demonstrations. The request met with a moderately liberal response, and portions of the orchards of the following persons were—after consultations with representative growers in the different localities—selected as being typical of the orchards in their respective districts.

Piccadilly	Mr. N. M. Schantz
Summertown	Mr. E. W. Percival
Forest Range	Mr. J. Vickers
Houghton	Mr. M. Maughan
Chain of Ponds	Mr. Elliot Hannaford
Angaston	Mr. W. Sage
Penwortham	Mr. C. H. Beaumont
Clare	Mr. J. Dall

The owner agreed in each instance to provide the necessary labour and appliances for spraying, and to carry out the work at the times laid down by the department. The department undertook to supply all spraying materials of good quality free of charge. The owner undertook to keep careful and separate records of the quantities of sound and infested fruits which might fall or be gathered from the trees from time to time. After such records had been taken the fruits became the property of the owner. Owing to the enormous labour involved in counting the fruits individually, it was arranged they should be examined and measured in bushels and portions thereof. Although this is a method which does not satisfy the seeker after scientific accuracy, it appeals to the commercial instincts of the grower.

A local committee of representative growers and other interested persons was arranged in each instance to watch the progress of the demonstration on behalf of the orchardists of the district. Although at the outset they manifested considerable interest, it is a cause for much regret that the gentlemen composing these committees could not follow up the work more closely, particularly as the season advanced. The owner, and each member of committee was supplied with a chromographed plan of the block of trees, on which was indicated the position of each variety of apple and pear therein. The trees to be sprayed, and the check trees to be kept unsprayed, as well as the sections which were to receive a different number of sprayings, were all clearly marked in the plans. They were also supplied with a printed pamphlet outlining the course to be followed in these demonstrations, of which the following is a copy:—

DEPARTMENTAL SPRAYING TESTS FOR CODLIN MOTH.

In connection with the spraying tests now being carried on in certain apple-growing parts of the State with arsenite of soda for the destruction of codlin moth, the following suggestions and course of operations have been formulated:—

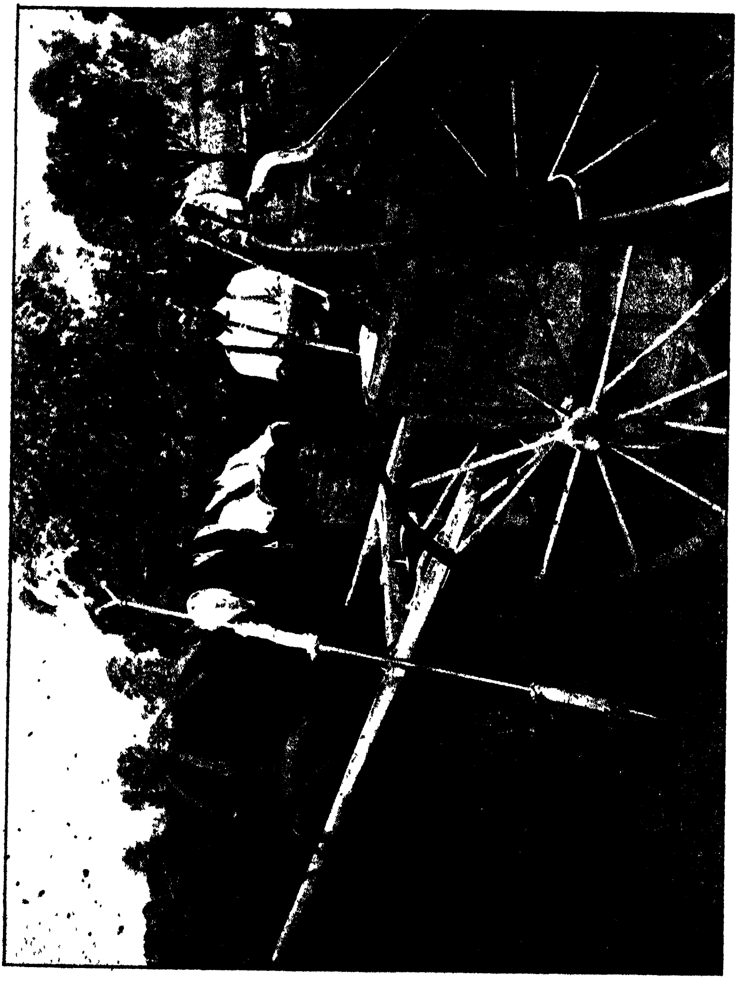


Plate I.—Double-action Pump of local manufacture used by Mr. M. Maughan, Houghton; showing 50-gallon tank swung between the wheels. Note bandages of soft material around the rod; these enable the operator to hold the quarter-inch rod firmly without cramping.

In the block of orchard selected the trees are all to be cleaned reasonably free of rough bark and other shelters for the caterpillars, and the soil kept clean of harbour for the insects. When the fruits have reached the size of a large cherry a bandage is to be placed around the stem of each tree in the usual manner. All such bandages are to be examined weekly and a record kept of the caterpillars caught therein. The fallen fruits are to be collected once during each week and the sound specimens sorted from the moth-burrowed fruits. Separate records will be kept of the respective quantities of each which are so collected and sorted. As fruits ripen from time to time they will be harvested and sorted and recorded in a similar manner. A certain number of trees typical of the size and varieties will be reserved as check trees. These will not be sprayed, but in every other respect will receive similar treatment to the sprayed trees, and the records of their produce kept separate from the others.

The solution of Kedzie's arsenite of soda supplied is to be used at the rate of 1 pt. in 40 galls. of lime water.

The following method of compounding the spray wash is recommended:—Take not less than 4 lb.—a little more is desirable on account of waste—of lumpy quicklime, quite fresh, and newly burnt, and slake it slowly by adding small quantities of water from time to time until the lime crumbles to powder and yields up its heat. Then thin down with clean water and strain out the sediment by passing the liquid through a bag or other close strainer. The pint of arsenite of soda should then be stirred into this strong milk of lime. After a short time the lime and arsenic mixture may be poured into the body of clean water which is required to make up the 40 gallons of spray wash.

Where it is desirable to combine Bordeaux mixture with this spray the arsenite of soda should be prepared in milk of lime as outlined above, and then mixed with the diluted Bordeaux instead of clean water to make up the required volume of spray wash, as follows: Suspend 4 lb. of bluestone just beneath the surface of 10 gallons of water in a wooden tub or barrel overnight, and in the morning it will all be in solution. Slake 4 lb. of fresh lime, thin and strain as described above, and then dilute it to 10 gallons with clean water. Into another lot of strong limewater, made by slaking and straining 4 lb. of fresh lime, pour 1 pint of the arsenite of soda. The 10 gallons of lime water and the 10 gallons of bluestone water are now mixed together, and the lime water containing the pint of arsenite is poured into this in turn. Enough clean water to make up the 40 gallons of spray is then added. This wash would then contain equal to 8 lb. of lime, 4 lb. of bluestone, 1 pint of arsenite, and 40 gallons of water. Freshly burnt lumpy quicklime is absolutely essential to avoid burning the foliage and fruits, and a little excess of fresh lime will do no harm, while a much larger quantity of stale lime will not act as a substitute for the quantities of fresh lime given herein. The arsenite of soda, as supplied in the tins, will destroy vegetation, and to change it into arsenite of lime, which will not injure the trees, fresh lime is essential.

The first spraying should be given as soon as the young fruits are formed, and the second about nine days later. In these two operations the spray should be driven into the calyx cups of each fruit. The third spraying should be applied 14 days later than the second. The fourth should follow 21 days later, and the fifth at a similar interval after the fourth. The object of the operator should be to keep the fruits coated all over with the spray.

WARNING.

Owing to the poisonous nature of the compound, it should not be breathed unnecessarily, and workmen applying or mixing the spray should wash their faces and hands before eating.

GEO. QUINN, Horticultural Inspector.

The arsenite of soda used in the demonstrations was manufactured by Messrs. A. M. Bickford & Sons, of Currie street, Adelaide. A sample made up of small volumes drawn from each of the 4-gallon drums before they were sent out to the owners of the plots was tested by Mr. W. A. Hargreaves, Analyst to the Marine Board. He reported it to contain the equivalent of over 0.905 lb. of arsenic trioxide ($As_4 O_6$), and 1.69 lb. of soda crystals ($Na_2Co_3 : 10H_2O$) per gallon. For all practical purposes this may be considered a correct form of the compound recommended by Professor Kedzie.

RESULTS OF ORCHARD TESTS.

CLARE.

The plot in Mr. Dall's orchard was selected because of the greater age of the trees, and because the codlin moth was said to have secured a stronger hold in this than in many of the younger plantations of the neighbourhood.

The trees were of medium size, and consisted of 92 apple and 10 pear trees. The former were made up of 15 Cleopatra, 31 Jonathan, 32 Ribston Pippin, 9 Brown Pippin (a late ripening apple), and 5 unknown varieties. The pears were all of the well-known Williams' Bon Chretien variety. The plot was divided into three sections. To one three sprayings were given, four to another, and a third was to receive five applications; but owing to heavy rains rendering the ground, which was flat and liable to inundation, too boggy this fifth spraying was abandoned. In the section sprayed three times a row of seven trees were kept unsprayed as checks. The pears, which were in a separate block some distance from these apple trees, but quite close to others, were included in the section sprayed three times. Of these three trees were reserved as checks. When the first spraying was given, on October 29, 1902, the petals had fallen from the flowers, and the calyx lobes of some kinds were almost closed together. About six hours was occupied in applying a little over 300 gallons of wash—an average of about 3 gallons per tree—as a few carried no crop. The weather was favourable for spraying. Changeable weather made up of light rains, strong winds, and calm days prevailed until the second spraying, which was given on November 11. The calyces were pretty well all closed at this date. About the same quantity of wash was used and time taken in applying it as on the former occasion. The fruits could be seen plainly, and the work done more effectively. On November 22 apples containing codlin caterpillars were found on trees in the check rows. Warm and fine weather prevailed until the third spraying was applied on November 27. Four hours were occupied, and a little over 200 gallons of spray thrown on. On this date the apple trees in the check row and the pear trees kept unsprayed showed caterpillars freely, and a few fruits were found which had been evacuated by the caterpillars. During December heavy rains were experienced throughout the district. The fourth spraying was applied to sections 2 and 3 on January 7, 1903, and the fruits on the sprayed trees were still keeping remarkably free of the pest. Three hours were occupied in applying about 100 gallons of spray. The weather set in wet and squally, and the spraying vehicle could not be taken on to the sodden ground. Hence the abandoning of the fifth spraying.

The intervals between the sprayings were as follows:—Between first and second, 12 days; between second and third, 15 days; between third and fourth, 40 days.

The following are the results:—

PEARS.

	Sound Fruit.	Infested Fruit	Percentage sound.
7 Trees, sprayed 3 times	38 bushels	4 bushels	90·4
3 Trees, not sprayed	3¼ ,,	¾ ,,	81·2

These figures represent the quantities harvested. No records respecting the fallen fruits were supplied; consequently it must be assumed they were not kept. This is unfortunate, as two of the check trees were not heavily laden, and when I visited the orchard with the committee the difference between the number of infested fruits upon the sprayed and unsprayed pear trees appeared to be much more marked than the above figures would imply. In connection with the plot of apple trees separate records were not kept of the quantities of fruits taken from the sections which received three and four sprayings respectively. Consequently the additional value of an increase in the number of sprayings cannot be estimated from the data at hand.

APPLES.

Date.	85 Trees Sprayed 3 and 4 times.					7 Trees not Sprayed.				
	Sound Fruit fallen.	Mothy Fruit collected from Trees and Ground	Sound Fruit harvested.	Mothy Fruit harvested.	Caterpillars caught in bands.	Sound Fruit fallen.	Mothy Fruit on Trees and Ground	Sound Fruit harvested.	Mothy Fruit harvested.	Caterpillars caught in bands.
1902.			bshls.	bshls.				bshls.	bshls.	
December 22 ..	21	3	—	—	—	12	84	—	—	—
1903										
January 9 ..	4	11	—	—	—	30	185	—	—	—
22 ...	430	100	—	—	—	90	196	—	—	—
28 .	957	288	—	—	—	114	132	—	—	16
February 4 .	—	—	—	—	14	—	—	—	—	20
12 ..	—	—	38½	1½	—	—	—	3	1	—
18 ..	233	40	—	—	—	159	478	—	—	—
March 5 ..	1,592	346	—	—	93	60	226	—	—	28
17	—	—	15	1	95	—	22	3½	2½	17
25 .	—	—	10	2	70	—	—	3	¼	13
April 30 ...	—	—	22	3	—	—	—	—	—	—
Totals ..	*3,237	*788	85½ *10¾	7½ *2½	272	*465	*1,323	9½ *1½	3¾ *4¼	94
Final Totals			96¼	10				11	8	

Percentage of Sound Fruit.	Percentage of Mothy Fruit.	Average Number of Caterpillars in Bandages per Tree.	Percentage of Sound Fruit.	Percentage of Mothy Fruit.	Average Number of Caterpillars in Bandages per Tree.
90·6	9·4	3·2	57·8	42·1	13·4

* In calculating quantity of fallen and gathered fruits, 300 are taken to represent a bushel. Of course, most of these fruits were about half-grown.

I am indebted to Mr. W. Kelly, the Inspector of Orchards in the Clare districts, for keeping records from which the above figures were compiled. The interest he constantly displayed in this tedious work is worthy of much commendation. The local committee, Messrs. Christison, Birks, Hague, and S. Smith, did not reply to my request for a report upon the proceedings, and I take this to be a method of showing the confidence they reposed in the report of Mr. Kelly.

PENWORTHAM.

Three blocks were selected from the orchard of Mr. C. H. Beaumont, which is situated in the hills west of Penwortham. The apple and pear trees vary in age from 45 years downwards. The old trees have the customary rough stems and refuges for the codlin larvae.

The block at the south end of the orchard contained 54 trees, made up of 34 Cleopatra, 9 Rome Beauty, and 11 Ribston Pippin. These trees were about 12 years old, and in full bearing. From these the central row of nine trees, possessing some of each of the above varieties, were kept unsprayed as checks. This block is planted on a rich, deep flat of heavy alluvial soil, and the fruits were much injured by "brown pitting" disease. The central block carried 44 trees, a year or two younger. These consisted of 4 American Summer Pearmain, 17 Cleopatra, 4 Rome Beauty, 4 Rokewood, 4 Golden Ball, 3 Sturmer Pippin, 4 Emperor Alexander, 4 Nickajack. A row of 11 trees, composed of one or more of each of the above, was left unsprayed as checks. The north block was located on a slope similar to the position of the central block. It contained 39 trees of a similar age to those in the lastnamed block. They consisted of 14 London Pippin, 9 Gravenstein, 12 Cleopatra, and 4 Stone Pippin.

A central row of 10 trees, representing the above three first-named varieties, was kept for check purposes. It was arranged to spray the south block five times, the central three times, and the north block six times. Owing, however, to the heavy summer rains the ground became impassable for horses and machines; consequently the programme was restricted. The south and north blocks received four sprayings each, and the central three. The remainder of the orchard was sprayed from two to four times by the owner. Quite a large number of the trees on the blocks did not carry more than a handful of fruits; hence the limited quantities of spraywash used. The following records were supplied by Mr. Beaumont:—

The first spraying was given on October 29, 1902. The calyx lobes mostly closed; some late trees (Rome Beauty chiefly) were not sprayed, as they were in full bloom. Time occupied, 1½ hours, and approximately 60 gallons of wash applied to each section. Weather suitable for spraying; calm and cool. All solutions made by adding 1 pint of stock sodium arsenite and 6 lb. fresh lime to 40 gallons of water. Hot, rainy, and windy weather prevailed in November. On November 10 the second spraying was put on. The fruit was well formed, and the trees full of foliage. Approximately 2 hours and 80 gallons given to each section. Changeable weather continued, much wind and showers of rain. The third spraying given on November 26. The fruits were now distinctly seen, and the work was done in a more complete manner. About 4 hours occupied and 90 gallons of wash used in spraying each section. On December 2 picked up about a bushel of apples in the three sections, and out of 20 under one Gravenstein in check row north block 14 contained caterpillars of codlin moth. In the others only three insects were found. Early in December (up to the 18th) 5½ in. rain fell, and much wind blew, but very few fruits were dislodged. On January 7, 1903, the fourth spraying was given to blocks south and north. Many of the trees bearing down with fruit, others having none at all. Used 80 gallons of wash, and occupied about 4 hours on each section. The weather continued changeable afterwards throughout the summer, rain falling at intervals, and windy days plentiful, causing the leaves to rub the spray wash from the surfaces of the fruits badly. On January 25 noticed young caterpillars in the fruits freely in other parts of the garden. Considered them to belong to a second brood.

The intervals between the sprayings were as follows:—Between first and second, 11 days; between second and third, 15 days; between third and fourth, 41 days.

SOUTH BLOCK.

Number of Trees.	Number of Sprayings.	Sound Fruit.	Mothy Fruit.	Percentage of Sound Fruit.	Number of Caterpillars caught in bands.	Average number of Caterpillars per Tree.
		bushels.	bushels			
45	4	89	1	98·9	52	1·15
9	None	23	¾	96·8	12	1·33
			CENTRAL BLOCK.			
33	3	59	½	99·1	40	1·21
11	None	20	⅓	98·3	8	0·72
			NORTH BLOCK.			
29	4	53	½	99	68	2·34
10	None	18	½	97·2	14	1·4

The check trees were chiefly bandaged with a thin white woven material to distinguish them from the sprayed trees, and Mr. Beaumont reported that the caterpillars almost refused to take refuge under them. This was borne out in other parts of the garden, where badly infested trees were bandaged with the same kind of material. Mr. Beaumont reported as follows on the work:—The whole orchard was sprayed, one portion twice only. Speaking generally, the results were perplexing. Early in the season we seemed free, and the summer apples were not damaged. In the check row of the north block the Gravensteins were lightly affected. Midseason fruits showed a little more attack of codlin, and the latest ripening sorts showed considerably more. I feel positive a later spraying would have prevented this. Respecting the costs, I consider they are practically nil. I have to spray against fungus diseases, and this arsenical spraying, I reckon, would not reach 1d. per case of sound fruit. As a matter of comparison I may say that the portion of my orchard sprayed twice only was some distance away from the main apple sections. At the end of the season I was astounded at the havoc made by the moth, which I compute at nearly 30 per cent. of the fruits.

Re the costs to your department I will not charge at all, as I consider the instruction received to be worth ten times the trouble and expense incurred by me. Of the local committee, Messrs. O. H. Castine and E. Treloar, of Watervale, reported as follows:-

We have much pleasure in informing you that we visited Mr. Beaumont's orchard during the spraying operations, and state that the blocks were in our opinion well and systematically sprayed with the arsenite of soda compound. The results were indeed satisfactory, in the early part of the season much more so than in the later part, and we feel confident that by spraying at the proper time—even as late as January here—the trouble with codlin moth can be brought to an 85 per cent. standard of clean fruit.

We are, yours truly,

O. H. Castine.
Edgar Treloar.

Watervale, May 20, 1903.

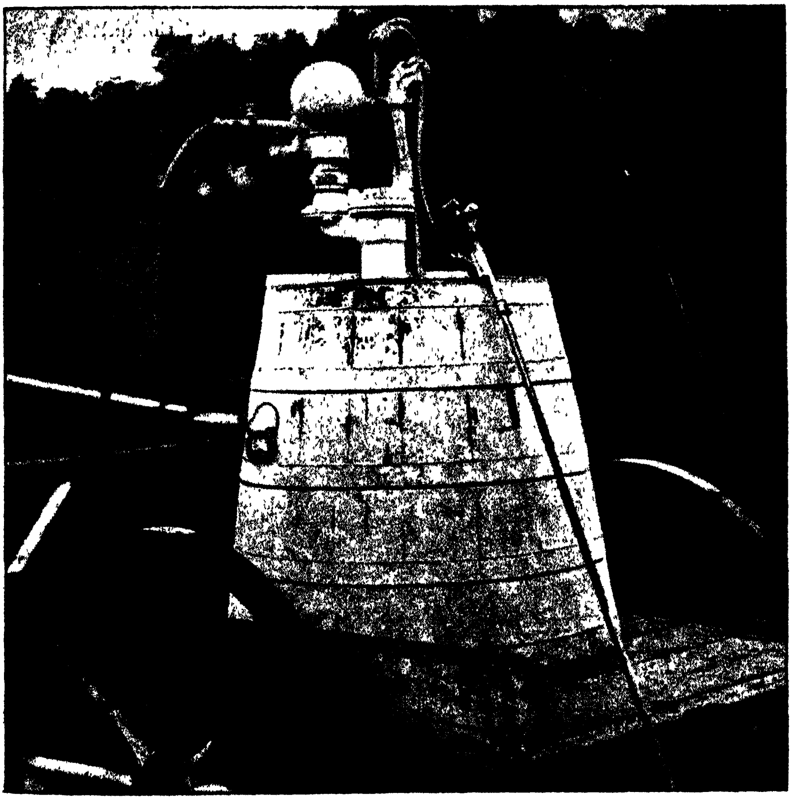


Plate II.—Douglas Garden Engine fitted to 50-gallon tank; used by Mr. J. Vickers, Forest Range.

ANGASTON.

The plot chosen in the north-eastern corner of the orchard of Mr. W. Sage contained 150 trees. Although 118 of these were of the well-known Cleopatra variety, seven other varieties of apples and pears were represented as follows:—7 Dunn's Seedling, 1 French Crab, 3 Cornish Gilliflower, 3 Stone Pippin, [illegible] Cellini, 2 Emperor Alexander, 6 Glou Morceau Pear. Of the 150 trees 10 were not in bearing, having been recently regrafted, while nine were reserved from spraying as checks upon the others, thus leaving 131 to be sprayed. The trees are planted on comparatively level ground, about 15 years old, and are quite typical of the trees growing in the neighbourhood. It was decided to divide the plot into two equal portions, and to spray one four times and the other five. This was done, as Mr. Sage intended to spray the remainder of the orchard three times.

Mr. P. Trimmer, the Inspector under the Vine, Fruit, and Vegetable Protection Act for Barossa, who examined the bandages, and collected and sorted the fallen fruits weekly, has supplied a complete record of his work. It is unfortunate that the owner omitted to supply a record of the dates of spraying and quantity of wash used:—

	131 Sprayed Trees.					9 Unsprayed Trees.		
			Caterpillars caught in bands.					
Date.	Sound Fruit.	Mothy Fruit.	64 Trees sprayed 4 times.	67 Trees sprayed 5 times.	Total.	Sound Fruit.	Mothy Fruit.	Caterpillars caught in bands.
1902.	bshls.	bshls.				bshls.	bshls.	
December 2...	—	—	—	—	2	—	—	—
9...	—	—	—	—	55	—	—	9
16..	—	—	—	—	64	—	—	21
23...	—	—	—	—	71	—	—	26
30...	—	—	—	—	76	—	—	9
1903.								
January 6...	—	—	—	—	41	—	—	5
12	7¾	¼	—	—	23	¼	—	12
20...	—	—	16	11	27	—	—	15
27...	—	—	20	12	32	—	—	13
February 3...	—	—	50	15	65	—	—	13
10...	—	—	41	7	48	—	—	22
17...	1¼	¼	110	25	135	¼	¼	16
24...	—	—	100	18	118	—	—	21
March 3 ..	—	—	78	8	86	—	—	12
10..	—	—	69	7	76	—	—	22
17..	12	1	42	7	49	¾	¼	18
24..	—	—	40	7	47	—	—	29
31...	18½	1½	41	9	50	1¾	¼	27
April 7...	—	—	59	5	64	—	—	14
9...	5½	½	—	—	—	¼	—	—
Harvested by Owner...	452	—	—	—	—	—	—	—
Totals ...	497	3½	666	131	1,129 Average per tree, 8·6	3¼	¾	304 Average per tree, 33·7

No record having been forwarded by the owner respecting the quantity of infested fruits sorted out of those finally harvested by him from the sprayed trees, or of the sound fruits harvested from the unsprayed trees, no useful comparison can be made. The most remarkable thing about these records is the difference between the number of caterpillars trapped on the trees sprayed four times and those sprayed five times.

Mr. Trimmer, in reporting on the work, says:—"Mr. Sage carried out the spraying in a very thorough manner. The members of the committee rendered good assistance in the early part of the season, but owing to pressure of work in their own holdings later on they could not give much time to the test plot. I would advise growers to remove the soil around the stems of the trees for several inches deep when making the final inspection of the bands, as many caterpillars take refuge there. Fine weather prevailed between the first and second sprayings; between the second and third a little rain fell, and much wind was experienced. Early in December heavy rains fell, and spells of rainy and fine weather continued throughout the season. The December and January sprayings appear to be most critical, and I would advise the use of January dressings, no matter how clean the fruit looks. The growers here were jubilant until after December, and consequently showed some apathy in adopting further spraying precautions. The result was a marked increase in the number of infested fruits." Mr. Walter Sage wrote:—"I may say I am fully satisfied as to the value of the spraying. Some trees left unsprayed were very badly affected with codlin moth, but not so the sprayed ones." The members of the local committee reported:—We visited the orchard at various times during the season, and assisted Mr. Trimmer in going over the bands, &c., and as far as we can tell the work was, in our opinion, done thoroughly. The unsprayed trees early in the season had a much larger proportion of infested fruit upon them than the sprayed trees.

Charles Salter.
J. Trescowthick.
Richard Player.

Angaston, May 18, 1903.

CHAIN OF PONDS.

A detached portion of Mr. Elliot Hannaford's orchard, near Chain of Ponds, was selected because it was very typical of the tall trees in the apple gardens of the Gumeracha district.

It was situated on a gentle slope near to the River Torrens, and contained about 375 apple trees. Five or six varieties, viz., 354 Cleopatra, 3 Strawberry Pippin, 1 Scarlet Nonpareil, 1 Early Margaret, and about 16 Stone Pippin and unnamed sorts occupy the land. It was subdivided into three sections, to be sprayed three, four, and five times respectively. Only five trees were kept for check purposes. The first spraying was given on October 22 and 23, and one and a quarter days actually occupied at the work. Mr. Hannaford reports using 400 gallons of wash in this spraying. The calyx lobes were mostly closed at the time. The weather was hot and thundery, and misty rain fell at intervals between the first and second sprayings. On November 3 and 4 the second spraying was given, the fruits being well formed. About the same time was occupied and a like amount of wash used as in the previous spraying. Rough weather followed, and much rain early in December. On November 17 and 18 about one and a half days were taken up in applying 480 gallons of wash as a third dressing. The fruit looked well and uninjured at this stage. On December 8 the fourth spraying was given to blocks 2 and 3 only. About 240 gallons was put on in one day. The weather after this remained unsettled, occasional showers following upon fine or windy weather. The fifth and final spraying was given to the third section on December 28 and 29. Portions of the two days were occupied, and about 240 gallons were put on. This was a thorough drenching, and the heavy crop of fruit was well coated. It is to be regretted that Mr. Hannaford, in keeping records, did not take a separate account of the caterpillars trapped in each section earlier than February 10, no matter how few were present. In compiling the results from the check trees I estimated them from observations made during a visit at picking time. This was done because the owner's employes apparently mixed them up with the remainder, and no record was entered in the book.

The intervals between the sprayings were first and second 10 days, second and third 12 days, third and fourth 19 days, fourth and fifth 19 days.

The following results are compiled from the records kept by Mr. Hannaford:-

Date.	Sprayed Trees.									Unsprayed Trees.		
	3 Sprayings.			4 Sprayings.			5 Sprayings.					
	Sound Fruit.	Mothy Fruit.	Caterpillars caught in bands.	Sound Fruit.	Mothy Fruit.	Caterpillars caught in bands.	Sound Fruit.	Mothy Fruit.	Caterpillars caught in bands.	Sound Fruit.	Mothy Fruit.	Caterpillars caught in bands.
1903.	bus.	bus.		bus.	bus.		bus.	bus:		bus.	bus.	
Jan. 27 ...	—	—	50†	—	—	50†	—	—	50†	—	—	28
Feb. 10 ...	5*	1	84	5*	1	104	5*	1	81	5	½	—
16 ...	—	—	—	—	—	—	—	—	—	—	—	—
23 ..	3	½	66	3	—	61	3	—	28	½	—	—
Mar. 2 ...	—	—	—	—	—	—	—	—	—	—	—	18
10 ...	145	9	64	—	—	64	—	—	128	10	2‡	—
11 ...	165	5	—	—	—	—	—	—	—	—	—	—
12 ...	—	—	—	200	6	—	—	—	—	—	—	—
13 ..	—	—	—	—	—	—	100	3	—	—	—	—
14 ..	—	—	—	—	—	—	106	3	—	8	1‡	—
16 ...	—	—	—	—	—	—	216	4	—	—	—	—
17 ...	—	—	—	—	—	—	165	3	—	—	—	—
18 ...	—	—	90	—	—	82	99	4	97	—	—	—
	318	15½	354	208	7	361	694	18	384	23½	3½	46
	Percentage sound, 95·3			Percentage sound, 96·7			Percentage sound, 97·4			Percentage sound, 87		

* The owner gave 15 sound, 3 mothy.
† The owner gave 150 in all sprayed sections.
‡ Estimated.

In connection with this plot, Messrs. S. Hannaford, W. Redden, T. E. Banks, and F. W. Tippett consented to act on committee. The two first-named visited the plot several times, but the others did not act. Mr. S. Hannaford wrote to say—"I think the experiment proves that spraying with arsenic and lime is very beneficial in coping with the codlin moth." Mr. Redden said—"I visited the block several times during the progress of the work, and took bands off sprayed and unsprayed trees. In each instance the greater number of caterpillars was found under the bands on the unsprayed trees. I think the spraying a great success, and if it could be carried on a little later in the season it would prevent the late grubs getting in, as a good many did after Mr. Hannaford left off spraying. The owner expressed satisfaction with the results, and instanced a block near by, which he had sprayed twice, as losing in his estimation nearly 30 per cent. of the fruits, owing to the codlin moth."

FOREST RANGE.

A block of large spreading apple trees planted on rich flat ground was selected in the orchard of Mr. J. Vickers. There were 206 trees, made up of 13 varieties as follows:—110 Cleopatra, 48 Stone Pippin, 3 Norfolk Beefing, 2 Claygate Pearmain, 1 Winter Majetin, 5 Reinette du Canada, 10 Northern Spy, 15 Garibaldi, 3 London Pippin, 5 Scarlet Nonpareil, 2 Irish Peach, 1 Williams' Favourite, and 1 unknown. The plot was divided into two sections. One contained 84 trees, and was sprayed four times, the other carried 112 trees, and received five sprayings. In each block five trees were kept unsprayed as checks. The first spraying was given on October 22 and 23, 1902. At this time the calyx lobes of the flowers were open on all trees which had shed their petals, excepting the Irish Peach. Some trees had not come into bloom. Two days were occupied in putting on 440 gallons of the combined Bordeaux mixture and arsenite of soda. The weather was hot and sultry when spraying, and for some time afterwards. The spray appeared to damage the young leaves and fruits considerably, and the owner thought an irregular setting of the crop was due to the spraying. On October 31 and November 1 the second spraying was applied; some trees were still partly in bloom. The spraying was done in the mornings and evenings, and more lime, viz. 5 lb. to 1 pint of arsenite of soda, was used. Weather very hot at the time. About 1½ days occupied in putting on 540 gallons of wash. Hot weather continued, and the foliage again appeared to suffer, more especially on trees with woolly leaves, such as Stone Pippin. The third spraying took place on November 22, one day being occupied in putting on 160 gallons—a lessened quantity, as the fruits were now seen to be very scanty in numbers. Hot weather followed, and the leaves fell freely from the trees. The fourth spraying was put on on December 9, 120 gallons of wash being sprayed on in half a day. Again the leaves appeared damaged, but less than formerly. Heavy rains fell soon after. On December 31 the fifth spraying was given to the northern portion only, one day being occupied in spraying 160 gallons of wash. The foliage showed less damage after this dressing. In the fourth and fifth sprayings 6 lb. of lime was used to each pint of arsenite of soda.

The intervals between the applications were as follows:—Between first and second 7 days, second and third 20 days, third and fourth 16 days, fourth and fifth 21 days. The following results are compiled from Mr. Vickers' records:—

	196 Sprayed Trees.					10 Unsprayed Trees.		
	84 Trees, 4 Sprayings.		112 Trees, 5 Sprayings.					
Dates.	Sound Fruits.	Mothy Fruits.	Sound Fruits.	Mothy Fruits.	Caterpillars in bands on 196 trees.	Sound Fruits.	Mothy Fruits.	Caterpillars on 10 trees.
	bushels.	bushels.	bushels.	bushels.		bushels.	bushels.	
January 8...	—	—	—	—	21	—	—	13
14...	—	—	—	—	21	—	—	127
24 ..	—	-	—	-	57	—	—	10
February 3...	—		—	—	94	—	—	34
7...	—	—	—	—	23	—	—	8
16..	—	—	—	—	26	—	—	11
23...	—	-	—	—	16	—	—	7
March 4..	—		—	—	21	—	—	13
11...	—	—	—	—	58	-	—	10
21. .	—	—	—	—	72	—	—	12
23 to 26..	98¼	1¾	129	2½	—	—	—	—
April 4.	—	—	—	—	23	—	—	13
6 to 18 ..	—	—	205½	14½	—	24½	2¾	—
14 .	—	—	—	—	5	—	—	5
28 ..	—	—	—	—	—	—	—	4
Totals ..	98¼	1¾	334½	17	437	24½	2¾	267
	Percentage sound, 98·25		Percentage sound, 95·2		Average per tree, 2·2	Percentage sound, 89·9		Average per tree, 26·7

If the caterpillars caught in the bands on the sprayed trees had been recorded to the sections which were sprayed four and five times respectively, and the caterpillars caught on check trees had been likewise separated, these results would have proved more valuable. The fruits from check trees should also have been reckoned separately, as they were taken from trees growing in the two sections. The general comparison of the caterpillars trapped in sprayed and unsprayed trees is worthy of note. When the quantity of apples reckoned as attacked in the sprayed sections is considered, the fate of many which entered apples may be surmised. The reason a higher percentage of sound fruits was obtained from the section sprayed four times than from those trees sprayed five times is probably indicated in the fact that the fruits were taken from the former plot from 25 to 11 days earlier. It will be noted that at the same time as these fruits were gathered a larger quantity showing an equally high percentage of sound apples was gathered from the block sprayed five times. During the period mentioned above the remaining fruits on this section showed 5 per cent. more infestation. One is not surprised at this when it is remembered that about 3½ months had elapsed since they received their last spraying. In connection with this demonstration more damage was done to the foliage than in any of the whole series under my supervision The even quality of the stock solution of sodium arsenite as evidenced by the analysis quoted in this report is practically assured. Mr. Vickers is known to be careful and methodical in any work he undertakes, so that his assurance that the wash was correctly compounded in accordance with the printed instructions may be accepted without reservation. It has been urged tha the foliage is more sappy and tender on the rank growing trees of the Forest Range Valley, but this condition was present in the Summertown block, and no similar damage was done. Assuming that the compound was correctly made, I can come to no other conclusion than that the damage was due to defective agitation of the wash when being applied. This appears to be supported by the irregular character of the scorching—some trees having been burnt and others of the same variety left practically uninjured, though both received the spray together from the same tankful of wash. It must be borne in mind that these trees were much affected by red spider and powdery mildew, which doubtless rendered them more liable to injury.

The local committee reported as follows:—We have visited Mr. Vickers' orchard where the arsenical spraying has been tested, and are of the opinion that as far as arsenical spraying for destroying codlin moth grubs is concerned it has done good. It has, however, damaged the trees here. When we have visited the orchard we have found that there were three times as many caterpillars in the bands around unsprayed trees as in those around the sprayed trees. We are also of the opinion that one year is not a fair trial, and would suggest this arsenical spraying should be continued for another two years on the same blocks of trees. Signed:—

J. Sharpe.
H. Green.
R. E. Townsend.

Forest Range, May 23, 1903.

SUMMERTOWN.

The orchard of Mr. Percival was secured because in it were fairly represented the tall, irregular, wild, entangled types of trees found in the market gardens of the neighbourhood. They had undergone a severe "lopping" during the previous winter, and the result was a mass of dense leaf growth accompanied by a very moderate fruit setting. These conditions made the task of effective spraying a difficult undertaking. The orchard contains a little over 300 apple and pear trees, and many other kinds. Of the above named fruits there are no less than 33 distinct varieties in the garden. With the exception of four trees kept as checks, it was arranged to spray the whole of the apple and pear trees five times. Owing however, to the reason given later on only four applications were given. The first spraying was given between October 23 and 30, and about five gallons per tree was put on those showing any crop. Showery weather prevailed, hence the extended time taken up by the work. The second spraying took place between November 6 and 10. Mr. Percival is of the opinion that the second spraying should be given about six days after the first, as the calyx lobes were pretty well all closed when he gave the second dressing. About two days were occupied in spraying if the broken hours be added together. The weather was alternately fine and showery after this. The third spraying was applied on November 26 and 27. The fruits looked

Plate III.- Douglas Garden Engine Pump fitted to 80-gallon galvanised iron tank; used by Mr. G. R. Laffer, Belair.

healthy, and a few infested specimens were found at this stage on both sprayed and unsprayed trees. Weather still showery and unsettled. The fourth dressing was applied between January 5 and 8, and some early kinds ready to gather were not sprayed. The fruits up to this stage were remarkably free of moth on the sprayed trees, but not so on those unsprayed. Very rough windy weather followed, and showers fell regularly throughout the summer. Respecting the proposed fifth spraying, Mr. Percival wrote:—"The fruits looked so very free when the time arrived to give this spraying, that I did not consider it necessary to spray them on this occasion, but since I consider I ought to have sprayed about the second week in February, because the later brood of moths increased in destructiveness very much in February and March." The intervals between the sprayings were as follows:—First and second 6 to 10 days, second and third 15 days, third and fourth 38 days.

The following table is framed from the somewhat meagre records supplied by Mr Percival:—

	Sprayed Trees.			Unsprayed Trees.		
Date.	Sound Fruits.	Mothy Fruits.	Caterpillars trapped in bands	Sound Fruits	Mothy Fruits.	Caterpillars trapped in bands.
1903.	bushels.	bushels.		bushels	bushels.	
January 10 ..	2	3	Average about 3 per Tree.	½	¼	37
,,	13½	¼	-	—	—	—
February ..	100	1	—	18	5¼	—
March	333	34½	—			
	448½	38¼	Average 3 per tree	18½	5½	Average 9·25 per tree
	Percentage sound, 92			Percentage sound, 77		

Mr. Percival examined the bandages once only, viz. on January 10. He subsequently stated that the fruits seemed to keep so free that he did not consider it "worth while" examining them again. Before this came to my knowledge too much time had elapsed to make a record reliable if the examinations had been resumed. The results as tabulated above may be satisfactory, as far as the orchardist is concerned, but the data is miserably inadequate to one who desires scientific accuracy.

The local committee reported:—After averaging the different sorts, the result was in our opinion a saving of 80 per cent. of the fruit, and we from own experience (most of the committee sprayed their own gardens) think four sprayings will be sufficient here if the fourth be put on in the first week in February to catch the last brood. We would suggest that to get effective results spur pruning should be adopted, as the ordinary way of pruning leaves too much wood and foliage to intercept the spray. Respecting the value of bandaging, Mr. Douglas favours its continuance as an extra precaution, but Messrs. Gore and Dunn dissent from this opinion. We would point out that the pruning of Mr. Percival's orchard is against getting good rusults, as the trees are too high and too thick in the centres. Signed:—

A. Douglas.
F. Gore.
G. A. Dunn.
Geo. Merchant.

Mr. Geo. Merchant subsequently wrote:—"I consider until the beginning of January the results were very satisfactory, the difference between the fruit on the sprayed and unsprayed trees being most marked. This held good to a lesser degree throughout the season. Taking into account the rainy season I consider the experiments very satisfactory. Had the summer been a normal one, that is with a dry spell from December to March, I believe the treatment would have proved entirely satisfactory. In a season similar to the past I would strongly recommend another spraying in February to replace what has been removed by the rains and wind. I examined some kinds when being picked for export, and found them very free from moth. In my opinion I think fully 85 to 90 per cent. of sound fruit would be gathered. On some trees of the Garibaldi variety the loss was greater in proportion. This I attribute to the dense foliage and scattered fruits hidden therein not being reached by the spray."

HOUGHTON.

Mr. Maughan's orchard near Houghton is situated up a gently sloping stony rise, with soil of only moderate richness. In consequence the 12-year-old apple trees are not overgrown, and by the aid of careful pruning they have been made to assume regular well balanced tops. They were the best suited to spraying of all the trees included in these demonstrations. The block selected is rectangular in shape and planted on modern lines with first class varieties. The 376 trees in it were made up of the following:—13 varieties of apple trees, viz.:- 27 Stone Pippin, 118 Dunn's Seedling, 66 Prince Bismarck, 21 Nickajack, 2 Mobb's Royal, 27 Rome Beauty, 5 Garibaldi, 13 Strawberry Pippin, 13 Rehn's Seedling, 13 Jonathan, 13 Hoover, 13 Maiden's Blush, 45 Cleopatra. The block was divided into three sections, to be sprayed four, five, and six times respectively but as the season progressed, Mr. Maughan decided he would spray the whole block five times. Two rows containing 38 trees comprising some of each of eight of the above sorts were retained as checks upon the sprayed trees. These were rows numbered 6 and 11, running across the rectangle, so the block was divided into three portions by them, and the unsprayed rows were fairly distant from each other. The first spraying was given between October 22 and 25. The calyces of most were open and petals fallen. About 2½ days were occupied in putting on 1¼ gallons per tree. The weather was squally, and light rain fell shortly after. The second application was given between November 3 and 5, two days being taken to spray on the same quantity of liquid as on the previous occasion. The calyces of some trees still open. Weather continued windy and sultry. The third spraying was given on November 14 and 15, the same time being occupied, and same

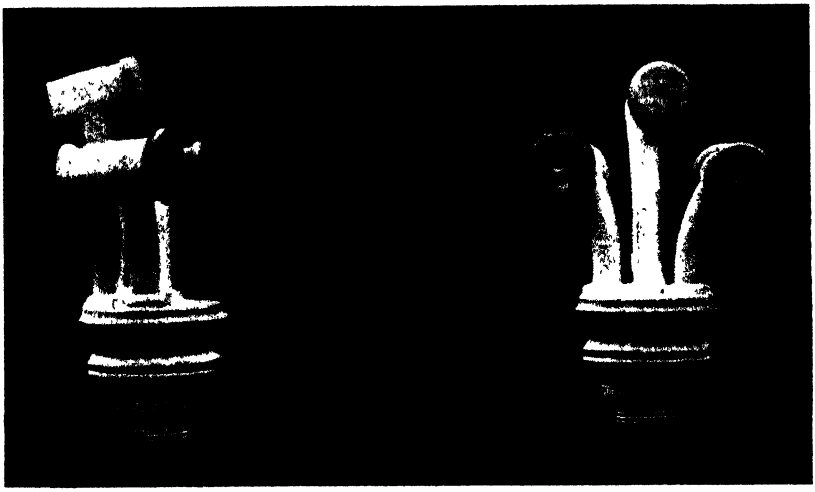


Fig. 1. Fig. 2.

Plate IV.—Triple Nozzles, showing (Fig. 1) the elevation and (Fig. 2) divergence of the jets. This is superior in design to most nozzles in use, but would be improved by having the jets on stems as short as possible

quantity of material used as in previous dressings. On November 21 a few infested fruits were found, particularly on the check trees, and eggs were found freely upon the fruits and foliage of these trees. Although the lime of the spray would render their detection difficult on the sprayed trees, a diligent search failed to reveal any, though several infected apples were found on them. The weather continued sultry and windy. The fourth spraying took place on November 27 and 28, a like quantity of wash was used as on previous occasions, but only two days were occupied in spraying. Rain fell a few days later, and unsettled weather prevailed for some time. The fifth spraying was put on between January 8 and 10, two days being occupied in applying an average of 1½ gallons per tree. The unsettled weather continued more or less for a month. At the beginning of February the number of infested fruits appeared to increase, and Mr. Maughan advises another spraying in February. He used large quantities of lime, even up to 15 lb. in 40 gallons of spray.

The intervals between the sprayings were as follows:—First and second 8 to 10 days, second and third 8 to 9 days, third and fourth 12 to 13 days, fifth and sixth 40 days. The following figures are compiled from records kept by Mr. Maughan:—

	336 Sprayed Trees.			38 Unsprayed Trees.		
Date.	Sound Fruits.	Mothy Fruits.	Cater-pillars caught in bands.	Sound Fruits.	Mothy Fruits.	Cater-pillars in bands.
1902.	bushels.	bushels.		bushels.	bushels.	
December 14 .	—	—	6	–	—	—
21 .	—	—	4	—	—	—
1903.						
January 4 ..	—	—	—	8	½	—
5 ...	3	—	--	—	—	—
6 ...	—	—	5	—	—	73
7 ...	—	—	2	—	—	33
21 ...	17	1	72	--	2	121
February 6 .	127	½	39	—	—	84
24 ..	14	—	—	—	—	—
25 .	18	½	--		—	—
March 2 .	50	1	83	23	5	221
6 and 7 ..	—	—	—	42	3	—
March 15 to April 7	548	27	139	41	29	397
Totals	777	30	350	114	39½	929
	Per-centage sound, 96·3		Average per tree, 1·04	Per-centage sound, 74·3		Average per tree, 24·4

PICCADILLY.

Owing to Mr. Schantz failing to apply the sprayings at intervals reasonably near to his instructions supplied in the departmental circular, the demonstration in his orchard was abandoned at an early stage. No note is, therefore, taken of the work.

THE COST OF SPRAYING.

Mr. Beaumont considers the necessary arsenical spraying would not add more than 1d. per case to the cost of producing clean apples, but no figures are given in support of the statement. Mr. Sage gives the following estimate·—Two men at 4/ per day, one youth at 3/ per day, horse, &c., 2/6, or a total of 13/6 per day.

In his block 4½ days were occupied in spraying, which totals £3 0/9 for this portion. Materials for spraying the block described herein at four gallons per tree per spraying would be 2,364 gallons. Arsenite of soda, when bough. ready made, costs 2/6 per gallon (it may be made up by the grower for 10d outlay by buying the arsenic and soda separately), and lime to neutralize would cost 1/. Thus 320 gallons of wash for spraying would cost 3/6. A. this rate the spraying material cost £1 2/4¼, making a total of £4 3/1¼. The charge per case—152 cases were gathered—would be within a fraction of 2¼d.

Mr. Vickers estimates the cost at Forest Range as follows:—Horse, labour, and depreciation of outfit for spraying an acre, 12/6. At this rate, for giving two acres four sprayings and one acre an additional dressing, the cost would be £5 12/; with four gallons of sodium arsenite, at 2/6 per gallon, 10/: and nine bushels of lime, at 1/ per bushel, 9/, gives a total of £6 11/. At this the cost of spraying for the 433 cases of sound apples would be a fraction over 3½d. per case.

Mr. Hannaford gives the following estimate of the work of spraying about 370 trees, say 100 three times, 70 four times, and 200 five times:—

2 youths, six days, at 2/6 per day 1 man, six days, at 5/ per day	£3	0	0
Horse hire, depreciation of plant	1	17	6
Spraying material, at 3/6 per 320 gallons		19	3
Total	£5	16	9

From these plots 1,220 cases of sound fruits were recorded. The above expenditure would be at the rate of a fraction over 1d. per case.

Mr. Maughan's estimate is as follows:—

10¼ days' work for two men at 5/; one youth at 2/6 per day	£6	8	1½
Horse, depreciation, &c., at 2/6 per day	1	5	7½
2,110 gallons of spray, at 3/6 per 320 gallons	1	3	0
Total	£8	16	9

The 777 bushels of sound fruit would thus cost at the rate of nearly 2¾d per case for spraying.

In all of the instances quoted the cost of materials varied very little and facilities for applying the spray were pretty even, though some appliances used were more powerful than others. In computing the cost per bushel the crop has to be considered, as it costs very little more to effectively spray a heavy crop than to dress a very moderate one where the foliage is dense. In these blocks Mr. Hannaford's carried a splendid crop, and Messrs. Sage and Maughan's from good to fair, while those of Messrs. Vickers and Beaumont were very irregular and patchy. Taken altogether I think 2d. per bushel of sound fruit will be found a fair estimate of the cost of the necessary spraying for keeping down codlin moth in the orchards of South Australia with the appliances now at our disposal.

SPRAYING APPLIANCES.

Photographs of several of the outfits used in these demonstrations have been reproduced.

Plate 1 represents that with which Mr. Maughan did his work. It is a strong double action pump made locally. It did good work after a number of adjustments had been made to it. The vehicle on which it is mounted is well adapted for the purpose. It is strong, not too heavy, and owing to its peculiar construction the pump and barrel are set low down, so that they may be driven under over-arching branches. The pump drives two hoses, each fitted with a duplex cyclone nozzle, which is set on a long tube with a stopcock at its base. This pump has an automatic agitator attached to the pumping gear By means of bevel cogs the agitator makes a semi-rotary motion, and keeps the wash thoroughly swirled up with its propeller-like wings. Messrs. Dall and Beaumont used similar machines constructed by the same firm, but they were carried on ordinary drays.

Plate 2 shows a kind of force pump of the Douglas garden engine type used by Mr. Vickers. This is a strong powerful machine, and it drives the spray with great force through two hoses, each fitted with triple cyclone nozzles, with apertures 1 line in diameter. This pump is easily fixed on a tank or barrel, which should have an agitator similar to that used with the machine shown in plate 1 affixed to it. Fitted thus, I would consider it the cheapest, strongest, and most effective spraying apparatus procurable here.

Plate 3 illustrates a similar pump, as used by Mr. G. R. Laffer for two seasons with satisfactory results.

Plate 4 shows a triple cyclone nozzle used by the same gentleman. The side view is figured to show the "pitch" given to the third nozzle. This is a splendid spray distributor; but its weak point is the length of tubing upon which the nozzle rests. These nozzles should be practically stemless, or only possess sufficient "neck" to give them the necessary angles of elevation and divergence, so as to cause the spray to effectively cover as wide an area as possible. To do the spraying thoroughly and rapidly—which means cheaply, the orchardist needs a strong, simple, powerful pump, fitted with an agitator possessing either a rotary or semi-rotary action. It may be combined with the pumping mechanism, or detached and worked by windlass handle. If fitted in the former manner, the proper agitation of the wash cannot be avoided by careless workmen, though the labour of pumping is increased. The pump should possess a strong large air chamber, so as to maintain a high pressure. The strength of the pump should not be sacrificed to lightness, because to spray profitably in commercial fruit culture the appliances must be carried on a vehicle of some kind. The nozzles require larger apertures than are usually given to them, but these may be simply enlarged with any steel instrument having a sharp point. This enlarged outlet is required, so that a coarse, swift spray may beat aside the leaves which cover the fruits, and thus permit them to be coated with the wash. This point would scarcely be admissible were Paris green used, as the heavy copper compound would drop off; but with the lighter arsenite of lime this contingency need not receive much consideration.

SUGGESTIONS FOR FUTURE WORK.

It has been widely suggested that these demonstrations should be continued for two seasons more. It has, I think, been argued with much reason that the past season was not at the outset one in which the codlin moth pest started its ravages with full vigour, consequently the results tabulated in this report are open to be challenged as scarcely representing the odds to be encountered in ordinary years. Against this must be arrayed the constant showery and windy weather which nullified the work of the sprayer. After spending much mental effort in trying to put the often complicated records before me into tangible form, I am forced to the conclusion that very little advance would be made by repeating these demonstrations. Besides these demonstrations, many trials with this spray have been made by orchardists in pretty well all parts of the State where the codlin moth pest has established itself. Almost without exception they speak hopefully of the results. I consider, therefore, they will continue its use, and further demonstrations by the State on these lines are not called for. In place of such, however, I would suggest that an apple orchard of two or three acres in full bearing be leased by the department, and experiments be conducted on exact lines with this or any other suitable spray over a period of three or five years. It is only by having complete control of every fruit produced that exact results can be obtained, and progress be made upon a basis which will stand. In conclusion, my thanks are due to the owners of the blocks for the courteous manner in which they always received my suggestions, and the care they displayed in carrying out the not too pleasant work of spraying.

* * *

PREDICTION OF THE ALCOHOLIC STRENGTH OF WINE BASED ON THE SPECIFIC GRAVITY OF CORRESPONDING MUSTS.

By Arthur J. Perkins and W. R. Jamieson, B Sc

I.

The winemaker who was content to estimate the state of maturity of his crop, or to follow the progress of his fermentation, by such signs as were alone apparent to his unaided senses, is practically extinct in South Australia, and the somewhat erratic verdict of eye and palate has been almost universally superseded by that of the more reliable, if still empirical, hydrometer. We can have no wish to adversely criticise a revolution in daily practice that has so successfully severed one of the shackles of traditional routine; nor, without infringing upon the inexorable claims of what is economically feasible, can we offer, in lieu of the methods that present obtain, anything a shade closer to scientific accuracy. We recognise, in fact, that the accuracy of the information conveyed to the intelligent observer by hydrometers or saccharometers—to make use of a popular expression—is such as to amply satisfy the requirements of ordinary practice.

Whether, on the other hand, many winemakers take full advantage of this information does not appear equally certain. Betwixt the specific gravity of a must and the percentage of sugar it holds in solution, and inferentially the alcoholic strength of the wine to be derived from it, there exists a more or less strict relation, a knowledge of which should at times prove of considerable service to the winemaker. The range of this relation has been ascertained with tolerable accuracy for the musts of Europe, or those grown under analogous conditions; and from the correctly ascertained specific gravity of a must it is possible, by means of a simple calculation, to predict sufficiently accurately the alcoholic strength of the completely fermented wine. The fact, however, that under climatic conditions, varying within strictly narrow limits, neither soil nor variety appears to introduce disturbing elements of sufficient importance to render questionable the value of a constant mean, does not a priori justify the assumption that this same mean may be extended without modification to countries, such as our own, over which reign climatic conditions totally at variance with those for which the mean has been found to hold good. We are not aware that this problem has as yet received any attention in Australia, and during the past season we have made some attempt towards its elucidation.

II.

We deem it advisable that a brief resume of the various points involved should precede any statement or discussion of our results. The specific gravity of any impure liquid is a function of all the substances it holds in solution; and it can scarcely be said to be in direct ratio of any one of them, unless the latter preponderates to such an extent as to render insignificant the influence of others. In the juice of the grape these conditions are far from being realized; for whilst it is true that of all other substances in solution sugar undoubtedly preponderates, the non-sugar—to make use of a term occasionally used in similar connection—is present in quantities sufficient to render illusory the use of a simple ratio. This non-sugar is more or less heterogeneous—it consists of various mineral and organic salts, of soluble nitrogenous matter of gums, pectous bodies, &c.; whether per unit of liquid it remains constant in quantity; or whether, on the contrary, it varies proportionately to the sugar, or independently of the latter substance, does not appear to have been satisfactorily settled. Experience, however, tends to show that these variations of the non-sugar revolve within a cycle of limited dimensions; and that for all practical purposes it may safely be represented by a constant mean, the value of which may, however, possibly need some revisal under climates differing considerably from those under which it has been originally established.

The figure representing the mean value of the non-sugar in the must is variously fixed in Europe at from 30 to 33 grams per litre, the lower figure being in more general use. On this assumption the percentage of sugar present may be sufficiently accurately calculated from the following formula:—

$$Q = \frac{(D-1{,}000)\ 1{,}000}{1{,}600-1{,}000} \times 1.6 - N.$$

In which

Q = Sugar in grams per litre
D = Specific gravity of the must in terms of water at 1,000
1,600 = Mean specific gravity of the sugar
N = Non-sugar in grams per litre (i.e., 30 to 33).

To pass from the sugar present in the must to the alcohol of the fully fermented wine is a comparatively simple matter. Theoretically, one gram of sugar should yield 0.61 c.c. of ethyl alcohol of 0.794 specific gravity; now whilst in the laboratory, under conditions that obtain in careful experimental work, it is possible to realize this figure, it is generally admitted that the latter cannot come within the reach of the winemaker. It would appear that in the vat the loss of a certain amount of alcohol is unavoidable; and, whilst it is not possible to apportion in figures the burden of responsibility, the main determining factors of the phenomenon may be recognised in the volatilization of the spirit under the influence of relatively high temperature, and in its partial decomposition by various micro-organisms associated with the ordinary wine yeast. The experience of European countries has led the winemaker to expect from one gram of sugar not 0.61c.c. of alcohol, but about 0.59c.c.; and by multiplying the number of grams of sugar ascertained to be in the must by the latter factor, and dividing the product by 10, may be secured a fairly accurate prognostication of the future alcoholic strength of the wine. For those who wish it expressed in terms of proof spirit a further multiplication by 1.7525 is of course necessary. To what extent South Australian winemakers are justified in extending the use of this factor 0.59 to their own musts is a question we are not in a position to answer. That it has an important bearing upon our present subject matter is undeniable; unfortunately, lack of data restricts us for the present to a mere expression of opinion. Perhaps in the future we may be in a position to settle this point on more definite lines. Suffice it to say, that we believe that for South Australian conditions the factor 0.59 is too high; the use of open vats, with their large unprotected surfaces; the high temperatures that prevail within and without the vats; our frequent and often quite unnecessary aerations of the must—all tend to render the losses in South Australian vats higher than in those of Europe.

III.

With a view to placing our results in harmony with such data as might be obtained in any cellar in which must records are carefully noted, we determined, by means of Gay Lussac's hydrometer, the specific gravities of six musts. Pressure of other work did not, however, permit of the sugar estimations being completed at the time; and we were obliged to sterilize the musts by heating them under pressure. It is probable that, in spite of the presence of cotton wool plugs in the sterilizing flasks, this operation had the effect of slightly concentrating the must by evaporation. A careful estimation of the specific gravities made at a later date by means of the specific gravity bottle yielded figures uniformly in excess of those of the hydrometer; and, as we have confidence in the accuracy of the latter, the above explanation appears to us to be in accordance with fact. It is quite evident, however, that we could in the circumstances make no use of the hydrometric readings. All our calculations are based on those of the pycnometer. In Table I. are given the respective specific gravities, reduced to a temperature of 15 deg. C.

TABLE I.

Comparison of specific gravities by hydrometer at vintage time with those by specific gravity bottle after sterilization of must:—

Musts.	Pycnometer.	Hydrometer.
1.	1083.98	1077.30
2.	1093.72	1084.33
3.	1103.14	1095.28
4.	1113.22	1102.60
5.	1116.08	1115.36
6.	1123.82	1119.92
7.	1127.10	?

(To be continued.)

NOTES ON FOREST TREE PLANTING.

By Walter Gill, F.L.S., F.R.H.S., Conservator of Forests.

The first thing demanding attention in planting forest trees is the state of the subsoil. This is of even greater importance than the state of the soil in a country like this, which, in the trying months of dry summer heat, with the desiccating north winds so frequently occurring, taxes the capacity of the soil moisture to the utmost. Forest trees do not need rich soil, generally speaking, but they must have a suitable subsoil able to retain ample moisture or they cannot possibly thrive.

Hence it is that many a piece of land which will grow rank crops of cereals or wild oats and grasses fails to grow trees simply because there is no retaining subsoil. As long as the cool winter and early spring time prevail the grasses and cereals can grow luxuriantly, and when the soil moisture gradually becomes exhausted in supplying the constant drain made upon it by their rank growth it is time for them to begin ripening off in the usual order of their maturity. The drying of the soil, therefore, merely aids this process without producing any injurious effect, as by the time it cracks and opens out through loss of moisture the crop is off, and does not want any further assistance.

It is just the opposite with trees, most of which make very little growth—some none at all—during the cooler months, when crops grow fast. When the approach of spring, however, warms up the ground they begin to grow apace, and the warmer the ground gets the greater is its loss of moisture in many cases, and the sooner does it open out in cracks, which speedily end the life of any rootlets which, forming at the extremities of the main roots, attempt to extend the trees' root system. Thus it is that just when the tree requires the moisture the ground cannot give it because it has no retaining bottom.

Surprise has sometimes been expressed at the strong growth of grass, &c., in plantations where trees possibly have grown indifferently, and it has been considered that what would grow such grass would also grow trees equally well, but that by no means follows, as may readily be concluded from the foregoing statements. It must also be remembered that another highly important aspect of the subsoil question is that while a tree when little feeds on the surface soil (like herbaceous vegetation), as it gets older it extends its roots deeper and deeper till finally it feeds on the subsoil.

The primary importance of securing a suitable subsoil is thus plainly apparent. It is the good subsoil that backs the tree up in times of drought. Therefore only places where a good subsoil is to be secured should be planted with forest trees in any part of this State where testing heat conditions and a limited rainfall prevail. Neglect in this matter means sure death to the trees in drought times, no matter how well and for how many years they may grow promisingly in good times.

The best subsoil, all things considered, is a good permeable clay; and where this is to be found of a character sufficiently open to absorb all the rains that come, without causing the supersaturation of the surface soil, producing the boggy condition so often found over a tight clay, excellent results may be ultimately expected, even where the surface soil may be of a poor character.

The condition of the soil is also a very important factor in treeplanting. Stiff soils not being open enough do not absorb enough moisture in this country unless they are previously cultivated, and though fairly loose soils may not need ploughing so much as stiff ones do for collecting the moisture, they share with them the benefit that is derived from ploughing for the first year in any case, and sometimes more, in the burying of the natural vegetation, thus giving the young trees a beter start, with no rivals to rob them of the moisture. Very loose soils need not be ploughed, being easily entered by the rain, readily penetrated by the trees' roots, and easily worked by spade or hoe.

About 6 in. is deep enough, in ordinary cases, and the work generally done by a stump-jump plough, though not so skilful and neat as that by the ordinary plough, is quite good enough, as the site or place where each tree is planted should in all instances be well spaded, and the bottom soil under the ploughing be well broken with a bar if the spade or fork cannot do the work. When the places for the trees are thus properly attended to the gradual loosening of the unploughed soil below the 6 in. depth elsewhere may well be left to the influence of the rain falling from time to time, which will now all settle down well into the rough ploughing without running off, as would have been the case had holes without ploughing been tried.

In addition to being an excellent medium for collecting the rain water the rough ploughing often aids materially in protecting small trees from any specially late frost, and later on in shielding them from any hot winds which may occur in some districts. Of course should it be intended to continually cultivate year after year between the trees till they do not require it, having grown strong and wide enough to keep down weeds and protect the ground from the sun by their shade, then better ploughing may be desirable, with harrowing in addition. It will be amply repaid, no doubt; but in dealing with extensive plantations the cost of such additional operations generally proves a barrier.

In all cases the holes made for the trees should be plenty big enough to take the roots, and give them their usual spread without cramping. To jam a tree's roots into too small a hole is the trick of a lazy, slovenly man, who cannot in all honesty be called a "worker," but deserves the application of the word "slum" to rightly indicate the fine art pitch to which he has developed indolence. Treeplanting is hopeless in such hands! Another peculiarity of the lazy planter is to plant trees in, say, limestone country, without taking the trouble to see whether the holes are clear of stones at the bottom! Only one result can follow, of course, namely, the death of the tree. And were it not that these things have been seen it would seem hardly credible that any one would commit such blunders. These and other errors arising from indolence and carelessness are, however, responsible for the death of thousands of trees year after year. A timely word of caution may therefore prove serviceable, as "prevention is better than cure."

The trees which should be planted during July in the northern districts are pines and cypresses, and deciduous trees, such as elms, white acacias, poplars, willows, &c. Within an extensive radius of Adelaide, however, and further south and south-east, these trees may be planted from one to two months later according to locality. Most gums start better if planted later on, after frost has gone, which in the northern parts is usually about the end o' August.

Where circumstances allow of selecting the kind of weather for planting, only showery, damp days should be chosen for this work, but where men are especially engaged for planting a given area this course, however desirable, cannot always be followed, owing to the lost and broken time which would result causing dissatisfaction to the men employed.

Great assistance will be found in guarding against the drying effects of windy and sunny days by having all the roots of the open-root trees well puddled before planting, and placed in planting boxes, in which to convey them to the field, with their roots well covered by the "puddle" or liquid mud, which should be about the consistency of thick cream. In this way the air is excluded from the roots entirely, and thus root exposure, one of the greatest sources of tree losses, is prevented. These remarks especially apply to small pines and trees of similar size. Other trees of larger size cannot be carried to the planters in boxes, but they can be puddled before starting, and also dipped again in puddle before being planted after arrival at the planting site. These things all mean extra trouble? Yes; but they mean success instead of failure! "If a thing is worth doing it is worth doing well," and to nothing does this apply more than to treeplanting.

NOTES FOR FACTORY MANAGERS.

CHEDDAR CHEESEMAKING.

By G. S. Thomson, F.R.S.E., Government Dairy Instructor.

[Continued from June issue, page 668.]

Faults *(continued)*.

Bitter Cheese.—Curd too long in the whey, sudden fall of temperature in cooler, and check in ripening.

Treatment of Fast Milk.—In the management of overripe milk the aim of the cheesemaker is to work the cheese so as to retard the fast increasing acid. His first action should be to apply steam immediately the full supply of milk is in the vat, and to raise the heat 2 deg above normal renneting. As soon as the necessary temperature is reached, a little more than the usual quantity of rennet is added to further promote a speedy coagulation, which usually takes from 10 to 20 minutes. The knives are brought into operation when the curd has barely reached the firm condition, and fine cutting is practised to avoid damage to the cubes which would otherwise occur by retention of the moisture following a quick and high scald. After handstirring for a few minutes the temperature of the curd is speedily raised to 102 deg. F., while the whey being reduced by a steady escape from the syphon. Why large quantities of whey are not run off is to safeguard against a check being put upon the acid. As soon as acidity is showing on the hot iron, and the curd sufficiently firm, remove to cooler, and stir a little longer than usual, but avoid a quick falling temperature. In cases where the acid is much in excess at this stage, wash the curd with clean water that has been boiled and cooled to 102 deg. F. Stir, and liberate the added moisture, and mat in a shallow layer. Cut into small blocks after 15 minutes, and pile lightly throughout the period of matting. Mill earlier, and salt with one-half pound extra.

Gassy and Holey Curd.—When milk is observed to be gassy, bad-smelling, and slow to ripen, some changes in the making are needful. The introduction of a starter would be attended with good to combat the evil organisms and increase the lactic acid. In the treatment of the cheese the opposite to what has been recommended for fast cheese is in most instances followed. When the curd is firm, cut into large cubes, stir well with the hands, and scald slowly to 98 or 99 deg. F. Draw off the whey when the curd is drawing over one-quarter of an inch on the hot iron, mat deeply, and cut into large blocks. Pile so as to flatten out the curd, mill a little earlier, stir longer, and salt heavier.

Cheese Bandaging.—Defective cheese bandaging has been noted by a few visitors of late, and I think it would be profitable in more than one way if managers would cap their cheese, and finish the cloths off neatly. Good cloths cost but a fraction more than the cheap ones, and the additional time given to finishing a cheese attractively need not interfere with the suggestion. It is to be hoped that the get-up of cheese will be more seriously considered by judges of dairy produce at our future shows.

Judging Cheese.

We arrive at a most important element in the cheesemaker's education. It is his ability of identifying a flavour in cheese—knowing its influence on the quality of the product, whether useful or injurious, vegetable or bacterial, where it originated, what favoured its action or development in the milk and curd, what should have been done to foster, arrest, or destroy its presence—that aids him in his practical and scientific work.

We agree that the value of cheese chiefly depends on the absence of foreign flavours, and we acknowledge the efforts of science in assisting us to recognise by taste, smell, and appearance the cause of many damaging features in the quality of the product. In the process of ripening, a knowledge of the changes is essential, and to test cheese at various stages of maturing and place them on the market at a time when the greatest gain will be effected adds very considerably to the capabilities of the manager and to the success of the factory. It frequently happens that a defective making of cheese attains its most profitable quality at an early period after manufacture, and every day following its value decreases, and may eventually descend to a low price before removal from the factory. It is a grave error to be guided by time in the marketing of cheese, and more especially when a record has not been kept of the chief points in manufacture. It follows that milk renneted sweet favours a slow-ripening cheese, while the opposite condition generally produces an article of earlier maturity.

Managers would find it profitable to enter in a special cheesebook a number of headings illustrating the condition of milk, whether sweet or acid, time and temperature of scalding, setting, acidity of curd at the dipping and milling, and conclude by a reference to the expected period of ripening. I would further recommend cheesemakers to discriminately pale their supplies at intervals, and acquaint themeslves with the condition of those approaching the marketing stage. A cheese of first-class quality is distinguished by its solidity, rich and full flavour, freedom from holes and discolouration. In testing, be careful to remove the plug without rubbing it against the rind, and a plug from a choice article should appear larger than the hole it came from.

From what has been said it must be evident to all that the subject is a vital one, and commends itself to the most serious consideration of every member of the industry. It must not be overlooked that one disastrous agent, namely heat, has added to our heavy losses during the trying summer weather, and the evil effects have shown ample evidence in the curing rooms of our factories. These extremes in temperature force a high and irregular evaporation of moisture from the cheese, followed by shrinkage and loss of fat and serious injury to the ripening process. So severe is the evil that a product of the highest quality is seriously reduced in price, and the second-rate article cannot find a sale, and undergoes further damage in storage in the city. This suggests to us the need for reform in the construction of ripening rooms, or the establishment of central depots where the cheese would be received and ripened at a steady temperature of 55 deg. F. or thereabouts, and removed for sale as soon as the proper degree of maturity was reached. A depot in the south-east and another in the city would meet the requirements of all factories.

INFLUENCE OF MATURED CURD ON THE QUALITY OF CHEESE.

The quality of cheese depends on the maturing of the curd in the vat and cooler, that is to say, the development of acid and the texture of the raw product throughout the process of manufacture. To produce a reliable and well-flavoured cheese from sound milk it is necessary to give the acid an opportunity to develop steadily, and not to hurry the work at any stage, from the time the milk is renneted until the curd is ready for the press. If this is not attended to, and the curd pushed, the green cheese goes to the press in an immature state, so to speak, and this grave mistake will never be rectified in the curing room. There is a time required in making, and that time must be given if a good article is to be turned out. It is plain that we are not permitting the necessary hours to the practical work in cheesemaking, as illustrated by the absence of the true nutty flavour in the ripe cheese, and the decadence of the attractive qualities when the product has been kept a little too long. By reason of the same the true characteristics of well-ripened cheese quickly fade when the article has been cut up, and exposed to the air of a room. From experience gained, I would recommend managers to give at least five hours and not more than six to the treatment of carefully ripened milk. That the practice in our factories of using fine-grained salt, same as added to butter, has increased the weakness, is not without consideration, as a large proportion of the preservative is lost in the press. Salt of a larger grain would not dissolve so readily, and would be better withheld in the curd to exert its good influences on the flavour and keeping qualities of the cheese.

GENERAL.

There is another matter which I wish to bring under notice, and that is the necessity for being provided with a suitable iron for testing curd. The iron commonly used is a round piece of metal, with a more or less glazed surface, which is not easily acted upon by the acid of the curd, thereby misleading the cheesemaker at critical stages in his work. A bar of iron, three-quarters of an inch square, should be kept exclusively for testing purposes, and when cheesemaking is over it is wise to clean the metal, without bringing it into contact with a hard and damaging surface.

I would further point out to cheesemakers the desirability of using the best dairy thermometer, as a mistake of one degree is not without its dangers to the quality of the product manufactured.

NOTES FOR BUTTER MAKERS.

By G. S. Thomson, F.R.S.E., Government Dairy Instructor.

The Export of Butter.

As the export season is approaching, I would draw the attention of butter makers to the necessity for care in the preparation of butter intended for the home markets. My recent visit to the large depots at Tooley street, London, and other parts of the United Kingdom, elicited information which will be of interest for those engaged in the business here. It is a matter for sincere regret that we have not come up to expectations as a butter-producing country, and our treatment of the export trade leaves much to be desired. I am not in a position to give an account of my enquiries on the commercial aspect of the trade, but I have cause to remind exporters of the necessity for placing on the British market a product of greater uniformity than has been the custom in the past. Authorities in London unanimously agree that the best Australian butter cannot be surpassed, but the want of reliability of our shipments has been a subject for severe comment. We have not studied our interests in the home market sufficiently, otherwise we would have been more guarded in our export of low grade produce. An outlet must certainly be found for the surplus butter, but it has been taken advantage of to the serious detriment of the industry. Our rival country Denmark has not trifled with her great and increasing interest in the London business, and the outcome of her praiseworthy efforts is illustrated in the big demand for Danish butter. So well has Denmark studied the wants of the British consumer that instances are common of the small farmer in England buying the Danish article and selling the supply of his own farm locally.

While discussing the subject at Tooley street, I raised the question of the great distance our butter has to travel as a serious objection to its arrival in London in the best condition. In reply I was asked to judge some boxes of colonial produce, which had been removed from storage a few days previously, after lying in the firm's cool chamber for weeks. The quality of the samples thoroughly demonstrated my contention that sound butter when properly chilled will arrive at Tooley street, London, from Australia in practically the same condition as it left the factory, and will maintain a perfect flavour for a further period of cool storage. I will go further by saying that experiments conducted by me at Adelaide proved that the delicate aroma of choice butter had increased in a number of boxes which had been kept at a low temperature for weeks.

Further argument brought forward from one buyer that grading of cream and butter at many of our factories must be unknown, and a recommendation to spend a month in Denmark would enable me to grasp the reasons of the success of that country. I had previously decided to go there, and after spending some days among the dairy produce merchants in London I left for Copenhagen, where I made a careful inspection of the milk depots, factories, agricultural experiment stations, and dairy laboratories. I was impressed with the determination of the Dane to uphold his reputation as a buttermaker, of his eagerness to improve his appliances and methods, his thirst for the cream of foreign dairying literature, and readiness to put every sound and profitable suggestion into practice. One of the most useful institutions visited was the Government butter-testing department, where hundreds of casks of butter are received fortnightly from the factories for examination purposes. These are dispatched by the factories on receipt of telegram from the department, and represent an average of the bulk supply prior to its removal from the country for carriage to the London steamers. As only one box is forwarded at a time there must have been some hundreds of factories represented at the period of my visit. Judging is carefully carried out by a board of competent men, and manufacturers are notified of their success or failure, with instructions for future treatment when found necessary.

The Value of Lime Water.

Having enjoyed the privilege of testing the samples, I was surprised to find a marvellous equality throughout the vast number of casks. My endeavour was now to ascertain how this distinguishing feature of Danish butter was maintained, and with that object in view I left for the country districts to study the question on the spot. Calling at the farms first, I soon recognised that care in milking was receiving very strict attention by a few of the farmers, and a system of milk cooling was, in a great majority of instances, practised. Beyond the latter element in milk preservation, nothing else of special interest to the buttermaker was in evidence. Proceeding to the factories, my attention was at once drawn to the perfect cleanliness of the buildings, machinery, and utensils. The air in the rooms had a feeling of purity and sweetness, and everywhere one found illustrations of the factory worker's sense of responsibility of the dangers of germ life, and how to successfully enforce preventive measures against the possibilities of bad odours in the factory. The very wide application of limewater to utensils and hot lime to the inner walls of the buildings is an important factor in the manager's education, and I did not find one instance of neglect to enforce one of the most valuable practices in Danish dairying. One man remarked to me that factories were drenched in the solution every day of the week, and from my observations there was no exaggeration in the statement. The question arises:—If the experience of the Dane goes to prove that taints have quickly disappeared in their cold climate since the uses of lime became general, why should we not have a much greater reason to adopt the system in a climate of far higher temperatures, and with factories less favourably constructed to ensure freedom from hurtful smells. Our butterworkers, pounders, wooden and iron utensils, and principally churns do not possess that sweetness of smell which is so desirable in successful buttermaking, and so characteristic of every item in the equipment of a Danish factory.

Cream Ripening.

The universal adoption of pasteurization has undoubtedly been instrumental in bringing the dairying industry of Denmark to its present flourishing position. Cream ripening by natural fermentation is a thing of the past, and to-day the factories are supplied with a standard culture, specially prepared at the Government laboratory. A similar treatment of the milk at all the factories, the introduction of the same culture to the cream, an equal care in ripening, churning, and working have given the butter uniformity in flavour, which has captured for Denmark the highest position in the market of Britain.

Cream ripening, which decides what the flavour of the butter is to be, has reached to a science of the greatest importance, and the Danish buttermaker makes a close and careful study of the conditions necessary to secure a successful acidity, while the chemical and bacteriological changes in the cream are not neglected. A special apartment is allotted for this branch of the manager's work, and upon no account is anything permitted to interfere with true lactic development. We are decidedly weak in this department of work, and although pasteurization and pure cultures cannot be brought into use in many of our factories, more conveniences might be given for the better treatment of cream for churning. The losses occasioned in South Australia through unsuitable rooms for ripening purposes must be deplorable, and the efforts of directors to remove defects in their factories should be at once directed to this great source of evil. Larger cream vessels are required, fitted with stirring rods, having a disc at the bottom for use in mixing the cream at intervals during ripening.

GRADING CREAM.

Most of the milk in Denmark is carted to the factories in drays, which go around and collect the cans at suitable places along the route. Upon arrival at the factory the supplies are closely examined by the manager, who puts on one side any objectionable sample, which is either used for second-class butter or returned to the farmer. In the case of cream, inferior qualities are churned separately, and the butter dare not be used for export purposes, otherwise the reputation of the factory will suffer, and if repeated many times the public would regard the offence in a most serious light. So careful is the Dane in preserving the name of his country in the London market, that only the choicest quality is exported to London, while the second rate article is consumed in Copenhagen. In further support of the trade thousands of tons of foreign butter reach Denmark annually to supply the wants of the population at a cheaper rate, and thereby add to the prosperity of the industry and country The opposite is the practice followed here. We consume the best butter ourselves and export what is not required. We are careless in grading: good cream and cream of medium quality are churned in one lot, and the produce exported as the choicest. It follows that the butter leaves our shore with a blemish, not strong enough to condemn it before shipment, but sufficient to cause it to become objectionable when it reaches the consumer in the old country. To make this thoroughly understood, the good cream predominates over the inferior, it has imparted its choice flavour to the butter which is retained for a few days, but when the keeping qualities of the supply is severely taxed the injurious influences of the second grade cream will be noticeable throughout the body of the butter. Factory managers must cultivate a keen palate and be able to recognise the true aroma of well ripened cream, and know when to churn to get the best quality and quantity of butter. As in cheesemaking, a study of flavours is necessary, commencing at the milk and ending in the manufactured article. I would earnestly appeal to all factories to enforce a judicious system of grading cream and butter, so as to ensure some protection against further injury to our export trade. We have something to learn in buttermaking, and we know much that would greatly benefit us and raise our position, but it remains undone.

(To be continued.)

NOTES FOR DAIRY FARMERS.

BY G. S. THOMSON, F.R.S.E., GOVERNMENT DAIRY INSTRUCTOR.

HOW TO IMPROVE THE MILKING HERD.

I have for years advocated grading of milking stock by the uses of the Babcock test and spring balance, and it is gratifying to know that a few farmers have adopted the system with profitable results. On the other hand, many have considered the practice too scientific and complex for farm purposes. But this view is decidedly erroneous when it is considered that a boy of 12 years can be trained in a few lessons to conduct the test with accuracy, speed, and without breakages. At our factories, however, this course has not been pursued, as managers necessarily recognise the testing of suppliers' milk so important an element that a more responsible person is entrusted with the delicate duties. An encouraging feature in the application of the Babcock test is the moderate price of the apparatus, which places it within reach of every farmer. The unpopularity of the test amongst dairymen need not arise from want of instruction in how to use it, as factory managers would willingly explain and demonstrate the important points when engaged in taking the milk and butterfat readings of their milk supplies. And to further promote the interests of their suppliers many have expressed a desire to determine the quality of milk from individual cows, either weekly or fortnightly, at the cost of the sulphuric acid used; while other managers have offered to do the work gratuitously. But in the grading of stock, it would be more in keeping for the farmer to test his cows at his own farm. The upkeep of the Babcock tester need not be an obstacle to its uses; the small sum of 3/6 would meet the cost for the year on the average farm, and the time required to do as many as 20 cows would not exceed one and a half hours.

A special qualification of the test, and one commending itself to all breeders of milking stock, is its value when employed in conjunction with the spring balance in carrying on feeding trials. When systematically applied the farmer can ascertain what foods give the best results in milk, which cows respond to feeding most, and what is the maximum attainment of individual animals throughout the experiments. He is also able to study the rise and fall in the yield and quality of the milk, and by a little trouble the farmer becomes conversant with the good and bad qualities of every cow on his farm. What could be more interesting, educational, and more profitable than to know which cows give the highest in quantity or quality of milk, and improved most in bodily condition from a given ration, and the influence of change of food on the yield of each animal? The farmer would further discriminate between his bread winners and unprofitable cows, and his familiarity with the most valuable of his stock would guide him to success in breeding creditable milkers. It follows that good cows are more likely to produce better calves for dairying purposes than inferior animals, and it would be to the gain of the breeder to rear stock from cows of proved qualities than to purchase heifers at sales without a knowledge of the capabilities of their ancestors. The selection of the herd is very often entrusted to the dealer and the auctioneer. The former lives on the proceeds of his clever transactions, particularly on the profits of the nondescript animal, and the auctioneer cares not for the defects of the stock he praises, but pins his success on his ability to obtain the highest possible price for his client. Let the dairyman consider for one moment how frequently he has been bitten, and how persistently he has walked into the net through his endeavours to grade the milking herd in the saleyard instead of on the farm.

Rugging Cows.

I have illustrated many advantages accruing from the Babcock test and balance, but further assistance to the farmer will be derived when the apparatus is employed to demonstrate the best ways of providing shelter for cows. A true representation of the increase in butterfat and yield of milk is ascertained, and all suspicion removed of the adaptability of a practical and profitable system of keeping up the milk flow. To give effect to this very important element in successful dairy farming, manufacturers have been slow in taking advantage of repeated efforts to provide a simple and efficient covering for milking stock. But now that the market has been supplied, and many rugs in use, we must guard against abusing the virtues of the practice. A systematic and thoughtful course is the best to pursue, and the numerous cowkeepers who have failed to protect their stock against the evil influences of weather will find many reasons for regret. Experiments conducted by me some years ago provided conclusive evidence of the heavy losses the State was suffering And perhaps I am under-estimating the shrinkage in butter when I take the average deficit at one and a half pounds for every cow in milk throughout the cold and wet months of winter. Further, we are confronted with the increase of consumption of food to maintain normal milking and to meet the heavier demands of the animal's body. Were it possible to show the total discrepancies caused by cold to the health and milking propensities of cows during the wet season, some thousands of pounds would be the loss to the dairying industry of South Australia. The farmer must not delay until his neighbour has proved the utility of rugging or otherwise sheltering his stock, but let him at once make or purchase rugs capable of producing the desired result. I specially warn farmers not to use coverings of an absorptive and defective character, otherwise water will be retained in the bags, causing injury to the health of the cows, and the object aimed at totally defeated. A rug should be light, rainproof after a little use, and providing the necessary protection to the body. Do not neglect to keep the rugs off on mild, dry, and sunny days, to maintain hardiness of the cow's constitution, a feature which must not be overlooked. Let the covers be worn every night during the cold season. By following these suggestions the greatest benefit will be obtained.

EXPERIMENTS IN DAIRYING.

If found convenient, the following experiments will be conducted at the Agricultural College:—

1. Tests to determine the influence of rations on the weight of the cow's body, and on the quantity and quality of milk.
2. Milking at well balanced hours, and its relative value on the milk yield.
3. Rugging and its benefits.
4. Testing the milk of individual cows by the creamometer and lactometer in conjunction with the Babcock test. The weight of each cow's milk will also be taken.

In the interest of the factories an exhaustive investigation into the effects of milk kept under different conditions of preservation on the percentage of fat will be carried out. In the enquiry, rich, poor, and adulterated milk, sweet and acid milk will be tested, to determine the causes of peculiarities found in the appearance of the fat layer. Sulphuric acid in varying quantities and strength will be used in the Babcock test.

It is hoped to experiment on preservatives for butter, and to ripen cheese at low temperatures.

ROSEWORTHY AGRICULTURAL COLLEGE NOTES.

FARM.

BY J. D. TOWAR, PROFESSOR OF AGRICULTURE.

The seeding was finished on June 4. Upon the whole the crop is looking very well. Dahlitz Field, which was sown early to barley, is looking exceptionally well. The Island, with the exception of two sandy spots, is very promising. Flett's Field is very clean, uniform, healthy, and vigorous. The good, straight drilling, free from skips and balks, make this field exceptionally attractive.

A seeding of lucerne, made May 13, is making a very satisfactory growth This plot is convenient to the water supply, where it can be readily irrigated, and, if successful, will prove a valuable addition to our feed supply during the summer.

The seeding of Sainfoin, made on May 15, is thus far showing but few plants. This seed is quite slow to germinate, and may come on later, but the prospects are not at all favourable.

Seedings of both winter (Vicia villosa) and summer vetch (Vicia sativa) were made on May 15, and a good growth is promised. These vetches from seedings made a month later last year developed into most excellent crops, even with the extreme dry weather.

Sulla, sown May 15, is showing a few small, though healthy, plants. This seed was immersed in boiling water for ten minutes, the object being to insure a more perfect and rapid germination. Another attempt will be made in the spring with this plant and sainfoin in case these seedings are failures.

Rape and kale, sown May 20, are growing well. Older seedings of rape are furnishing large quantities of feed for the dairy cows and sheep.

Mr. Thomson is planning to carry out the following experiments:—(a) Determine the difference in the quantity and quality of milk between milking at well-balanced and unbalanced periods of the day. (b) Test the effect of various foods on the quantity and quality of milk. (c) Test the benefits of rugging dairy cows. (d) Experiments with milk preservatives and the preservation of milk. (e) Experiments in ripening cream with pure cultures. It is the plan to give as much of this work as possible to the students.

The dairy herd is looking exceptionally well.

The farm horses have finished seeding in most excellent condition. By paying careful attention to the collars, getting them properly stuffed and fitted, we have had practically no trouble with sore shoulders. We are trying the experiment of clipping the draught horses. Four heavy draught horses, two quite old, one eight years, and the other five years old, have been clipped, and will be worked regularly and continuously during the winter. Before being clipped these horses were weighed and notes were taken on their general condition. As a means of comparison similar weights of the unclipped horses will also be taken and notes on their condition from time to time recorded. At the end of the first day's work the report came to the Principal that the clipped horses did not "turn a hair," while the heavy coats on the unclipped horses were wringing wet with sweat.

From 180 ewes we now have 158 live lambs, and the prospect of a few more. It is safe to predict a 90 per cent. yield. The Dorsets are again much more forward than the Shropshire and Merinos, although the percentage yield of Shropshires and the strength of the young lambs equals the Dorsets.

During the past month we have found ready sales for young weaners and picked boars and sows for breeding. We now have a few good, young boars to sell. From the herd of young breeding sows, 12 to 15 months old, we can make a selection of one or two suitable to exhibit at the September Show of the Royal Agricultural Society. An experiment with molasses for feeding pigs will soon begin, the details of which will appear in the next report.

During the past month Mr. Faulkner has taken in hand the care of the fowls, and each week assigns a new student to the duty of attending them. We desire to enlarge the poultry runs, give them some cultivated ground and green crops to feed on, and gradually increase the stock so that the College may be liberally supplied with eggs and poultry. I am pleased to report that the students entrusted with the care of the fowls have thus far taken a keen interest in the work.

Fallowing was begun June 17, and will be pushed forward as rapidly as possible. Nottle's, No. 5, and Ebsary's will probably be ploughed for next year's seeding. A few cultivation experiments will be conducted with a view of getting some actual figures showing the influence on soil moisture of the various ways of treating fallow land.

EXPERIMENTAL VINEYARD.

By H. E. Laffer, Superintendent of Vineyard.

Pruning and ploughing are now well in hand. Owing to the soaking rains of the past month much of the lower-lying land is too sticky to work, but is improving with the few fine days lately experienced.

The block of orchard which it is proposed to irrigate has been grubbed of all old trees, and strips of land about 8 ft. wide are being subsoiled in anticipation of replanting with young trees. Space will be given to each species the members of which will be kept together.

A nursery is being started for the raising of young plant stock, and the propagation of plants will be carried out under the direction of Mr. Quinn.

We have procured a vine hoe from Mr. Schrapel, of Tanunda, for removing the soil from around the vines. As far as the implement has been tried it is very satisfactory. The land on which it was tried, besides being extremely sticky, carried a heavy crop of thistles. This, to a great extent, rendered the work very difficult, but in spite of these drawbacks the trial was very satisfactory, and the hand-hoeing was reduced to a minimum. I am convinced that in good, clean land the necessity of using hand hoes would be done away with almost entirely.

Considerable quantities of manures, principally superphosphate, are being applied to the vines this year. In connection with the cellar, all seasonable work has been proceeded with, such as racking of young wines and cider.

The following is a table of rainfall up to date:—

	Total.	Total from Jan. 1.
January	0.51	0.51
February	1.01	1.52
March	1.20	2.72
April	2.83	5.55
May	0.97	6.52
June	2.33	8.85

POULTRY NOTES.

By D. F. Laurie.

The Show season is well on, and many poultry owners, whether exhibitors or not, take considerable interest in the doings of various breeders and the positions occupied by the various breeds, especially the new ones, termed the utility breeds. Two noted Shows are over, the N.S.W. Poultry Club Show and the Essendon Poultry Society's Show, Melbourne. The most remarkable feature of both these Shows is the wonderful advance of the utility breeds and the retrogression of the purely fancy kinds. The enormous classes of Orpingtons and Wyandottes attest to the value and popularity of these breeds, and yet only six years ago I saw adverse comments made concerning my strong recommendation of the Wyandotte family, which I then well knew. The foremost breeds of the day are those I have advocated for many years, and if they are not spoilt by "cranks" and incompetent judges will long remain the utility breeds. As an instance what misguided fanciers may advocate, I may mention that on six occasions a well known breeder talked Wyandotte to me for at least a quarter of an hour each time. The only points he discussed were colour and marking—not a word had he to say for other important points, nor had he any thoughts of the utility points. Many of the prominent fanciers hate the name "utility breed," and never use it except to sell their stock. Now, can breeders of this type do any good to a breed other than from a fancy point? I was much struck with the truth of a sentence in a letter from an English breeder. Referring to certain new breeds—Faverolles, Campines, Lakenfelders, &c.—he said that at the present time, being more or less manufactured breeds, they were of considerable merit as utility poultry; but as soon as the breeders get them bred to standard all the utility points will have disappeared. This, of course, may happen, if no attempt is made to preserve the utility as well as the fancy points. There is a great increase in poultry of a very high class in this State, and while I am glad to note that more attention is being paid to many points, still there seems to be a preponderance of the fancy element which can be overdone. A great many of our breeders waste time keeping treble the number of breeds they should in order to win prizes at Shows. I see dozens of letters asking for birds fit to win at this and that Show, but only occasionally is there any reference to the question of egg production, or likely stock-getting powers for table-bird breeding.

As an example of the popularity of the utility breeds, I will quote a few records of the late Essendon Show, fancy classes including:—Brahmas 4 Cochins 11, British (modern) Game 17, Spanish 9; utility classes—Dorkings 27 Houdans 14, Plymouth Rocks 17, Orpingtons 152, Wyandottes 161, Langshans 29, Old English Game 19 Indian Game 25, Andalusians 36, Minorcas 55 Leghorns 78, Anconas 8, Faverolles 4. Old English Game, Anconas, and Faverolles are of recent introduction, and will rapidly increase in numbers.

The S.A. Poultry and Kennel Club's schedule is to hand, and I am pleased to note certain improvements which now bring this club well in line with leading poultry institutions in the other States. Special classes are provided for ladies', export, incubators, and boys' classes. In addition, the Government has donated £15, which has been divided among the following breeds:—Dorking, Langshan, Orpington, Wyandotte, Indian Game, Aylesbury and Pekin ducks, and export classes. The Society offers a coronation cup, value £4 4/, for excellence in any one breed in the poultry sections; the Orpington Challenge Cup, value £4 4/; the Wyandotte Challenge Trophy, and a Challenge Trophy in the laying section. The classification is extensive, and most of the new breeds have classes.

Several valuable additions to our poultry yards have recently been made. Mr. S. H. Pitman, of the Sargenfri Yards, has received a valuable black Orpington cockerel and a trio of first-class White Wyandottes from England I have not seen them, but hear they are of splendid type and quality. Mr. Eldridge has a Partridge Wyandotte pullet, and several silver-laced Wyandottes of excellent quality from noted yards in Victoria and N.S.W. The Ucolta Poultry Yards have received what is reported to be a very fine Buff

Orpington cockerel. I am expecting some first-class Old English Game pullets, carefully selected, to mate with my present stock. I see some American brown Leghorns and white Wyandottes are expected for another breeder, and birds are frequently coming from the adjoining States, not, however, all of good quality. With all these additions South Australia should soon be in a position to take a full share in the interstate poultry trade, and make a definite start with the English market. I have been told by one in the trade that a fair number of birds fit for the English market are coming in, and a good supply fit for South Africa. What seems lacking is enterprise. There is plenty of money to be made in the poultry industry if more energy is infused, aided by proper organization.

It looks like a standing rebuke that eggs should remain at the present prices in West Australia and South Africa. The latter is a market that should be thoroughly exploited while it is available. New Zealand is shipping a large number of birds to South Africa, and the orders are pouring in. Judging from past experience, the trouble seems to be that careless people will ship birds of the most inferior quality, and badly packed - a most flagrant case has already been reported in Victorian papers. Perhaps the time will come when our farmers will combine to ship their eggs and poultry; combination is attracting the attention of the thoughtful nowadays, and seems the only means by which the producer can hope to progress and get his fair proportion of the proceeds of his production.

The fanciers of this State have been much agitated of late on the tick question, and for a time the innocent suffered with the guilty. With few exceptions breeders take little trouble to rid themselves of this pest. A would-be instructor of the public states that this pest cannot be eradicated, and quotes a case which looks like a veiled plea for spontaneous generation. Now, such arguments are ridiculous and contrary to fact. Lazy, incompetent people will always have the tick with them. Notwithstanding all the trouble there has been, I have heard of tick-infested birds being sent across the border and trouble following. It would be a good thing if the railways authorities could be moved to pass a regulation against tick-infested poultry travelling in trains. The careless breeder would then be moved to action. Iron houses, suspended perches, and a few pints of kerosine and oil made into strong boiling emulsion will soon settle the question if operations are carried out properly.

THUNDERSTORMS.

I am frequently asked if heavy thunder affects the hatching of eggs. The consensus of opinion nowadays is that it does not, and a great many cases are quoted. I have noticed two things:—Some hens when sitting become very restless, and may stand over their eggs during a cold night, and loss may occur in this way. Again, incubators regulated by mechanism susceptible to barometrical variation may fail to hatch owing to too high a temperature being permitted at an important period.

INTRODUCING NEW BLOOD.

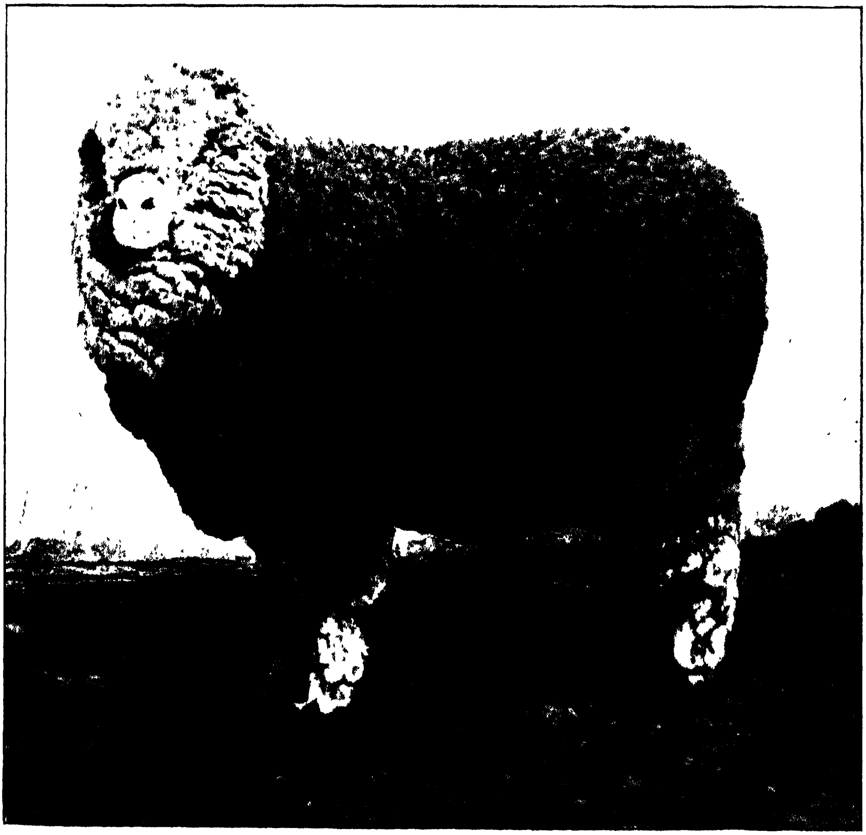
It is affirmed by most experienced breeders that the best way to introduce new blood is by the hen, not the male bird, as is usually the case. Laying characteristics can be safeguarded better by introducing new blood as follows: —You have a strain of good layers, but the breeding is too close to go any further. Select a hen of a known laying strain and mate with one of the male birds of your own strain. The progeny will be half your own strain and half new blood, and may be used to advantage, especially in the case of pullets, which can be tested for a season and mated later on as hens. By this method you will get all the new blood necessary.

OUR BREEDS OF SHEEP.

(Continued from page 684.)

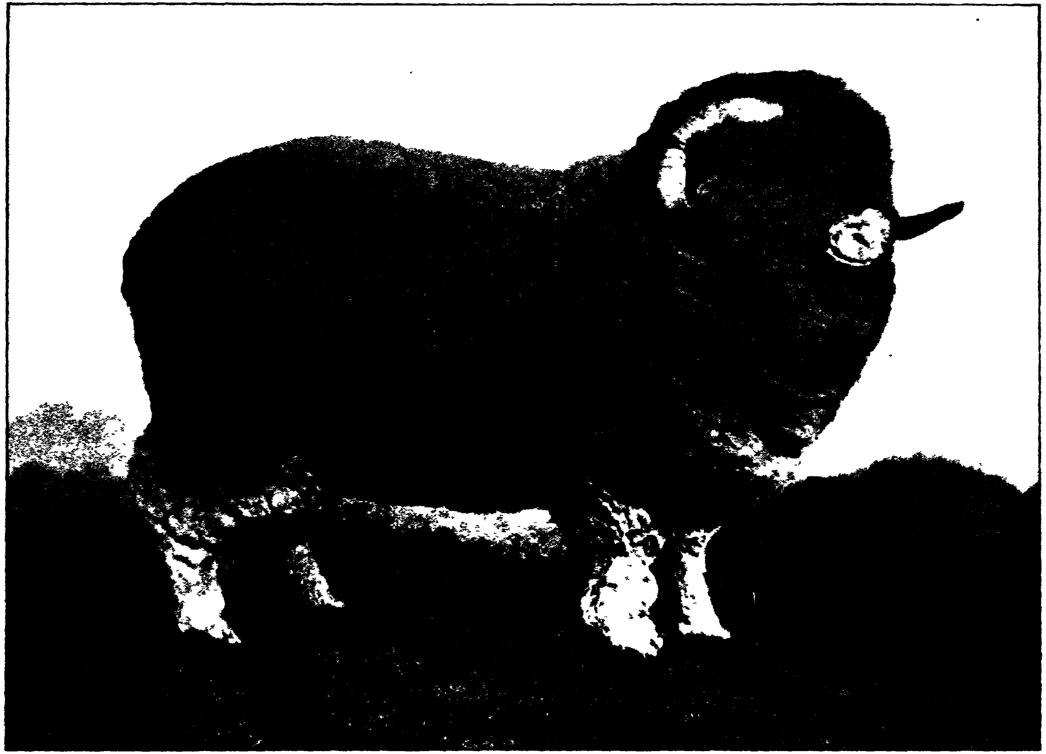
MERINOS.

Although at the present day the epithet of "cosmopolitan" may more truly be ascribed to the Merino than to any other breed of sheep, yet it is, and will long remain, typical of Australia, in which its finest representatives are probably to be found. Unapproached in the superb quality of its fleece, the Merino stands out almost a freak of nature amongst the many breeds that have been created by the ingenuity of man. And the halo of romance that surrounded its early history gives it a claim to distinction that is apt to be forgotten in our prosaic days Originating probably amongst the nomadic tribes of Asia, the Merino was introduced into Spain in the days of the Arab invasion; here, when Iberia awoke and repelled her more civilized invaders, it was left to the mercy of a people who at all times have been lacking in the "breeder's eye." For three or four centuries the Merino remained the exclusive property of the Spaniard, losing perhaps what of bodily development it may have possessed, but tenaciously adhering to its unique fineness and quality of wool The Spaniards were far from ignorant of the exceptional



MERINO EWE, "THE QUEEN."

Bred by John Murray, Esq., Rhine Park, South Australia. Grazed at large on natural grasses only. Champion and First, Adelaide, 1896; cut Prize Fleeces, Adelaide, 1896, 1897, 1898.



Merino Ram, "Monarch."
Bred by John Murray, Esq., Rhine Park, South Australia. Grazed at large on natural grasses only.
First Prize 2-tooth Adelaide, 1898.

qualities of their fortuitous possession; and they were determined to keep within their own hands the enjoyment of it. Stringent laws prohibited the export of any live animal, and the penalty of death was not looked upon as too light for the culprit who looked more to personal gain than what was considered his country's welfare. Towards the middle of the eighteenth century the liberation of the Merino began; so high was it in popular esteem that its fate was fought out in international treaties of peace. In 1796 France acquired the right of importing annually 100 rams and 1,000 ewes, and from that time dates the triumphal spread of the Merino over every portion of the world, the climatic conditions of which were not fatal to it.

Carrying a fleece of exceptional value hardy, inured to scant herbage, and frequent shifts of pasture, the offspring of the Mediterranean's dry, hot shores, the Merino was peculiarly adapted to the wants of Australia's first colonists. If the Spaniard is not a breeder, the Englishman is the king of breeders; and those acquainted with the unimproved European Merino must confess to admiration when brought face to face with the best types created here by the genius of the sons of Britain. We had hoped to secure from Mr. John Murray, of Eden Valley, some notes on this breed, with which his family name has been so honourably connected; but to exceptional qualifications as a breeder, he adds modesty and reticence, and beyond supplying us with illustrations typical of the breed, he preferred referring us to a paper read by Mr. J. H. Angas, of Collingrove, before the Royal Agricultural Society in 1884. We have secured Mr. Angas's permission to make use of his paper, and desire to acknowledge our indebtedness here.

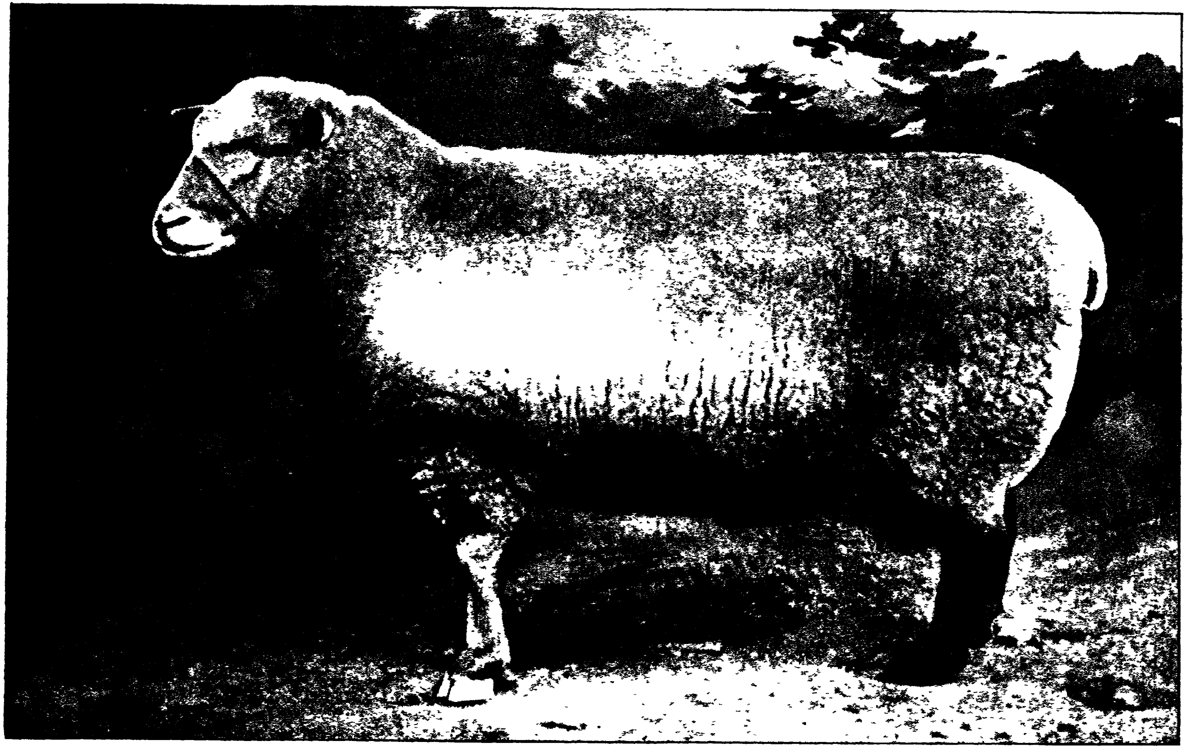
The first introduction of Merinos into South Australia appears to have taken place in 1836, under the auspices of the South Australian Company. These sheep were purchased in Saxony. In 1841 the company introduced a further lot of Mecklenburg rams "to secure the continued and progressive improvement of the flocks." Simultaneously, and at somewhat later dates, sheep were introduced from Tasmania and New South Wales. Subsequent importations of French, Spanish, and Saxon Merinos, helped, in the opinion of Mr. Angas, to strengthen the constitution of our flocks. He recognises at the same time that none of the imported stock in any way equalled the top studs of our most noted breeds at the time of writing (1884); and unquestionably we have not been beating time since then. We quote in Mr. Angas's own words, the characteristics of the best type of South Australian Merinos. Mr. Murray informs us that what was true in 1884 holds good to the present day.

"By constant and careful selection, good management, and superior judgment, the South Australian Merino has been brought to great perfection, and for intrinsic value, estimated by the returns from wool and carcase, cannot be beaten. With large symmetrical frame, healthy and vigorous constitution, clean skin free from wrinkles and kemp, silky face, great weight of fleece, long staple, ample yolk, good density, not too fine in quality, but uniform in character, all over the body, well covered, even, soft, and lustrous, such is the best type of the South Australian Merino of to-day." There is but one word that Mr. Murray would like to see added to this vivid description, and that has reference to the elasticity of the fibre, that is characteristic of our best sheep.

South Australians have no doubt done much towards the improvement of the Merino; but they have not succeeded in acclimatizing it to the conditions of cold, wet, badly drained land. Here, as in Europe, it is pre-eminently a dry country breed, suffering under moist conditions, such as prevail in our south eastern districts, for instance, both from fluke and footrot.

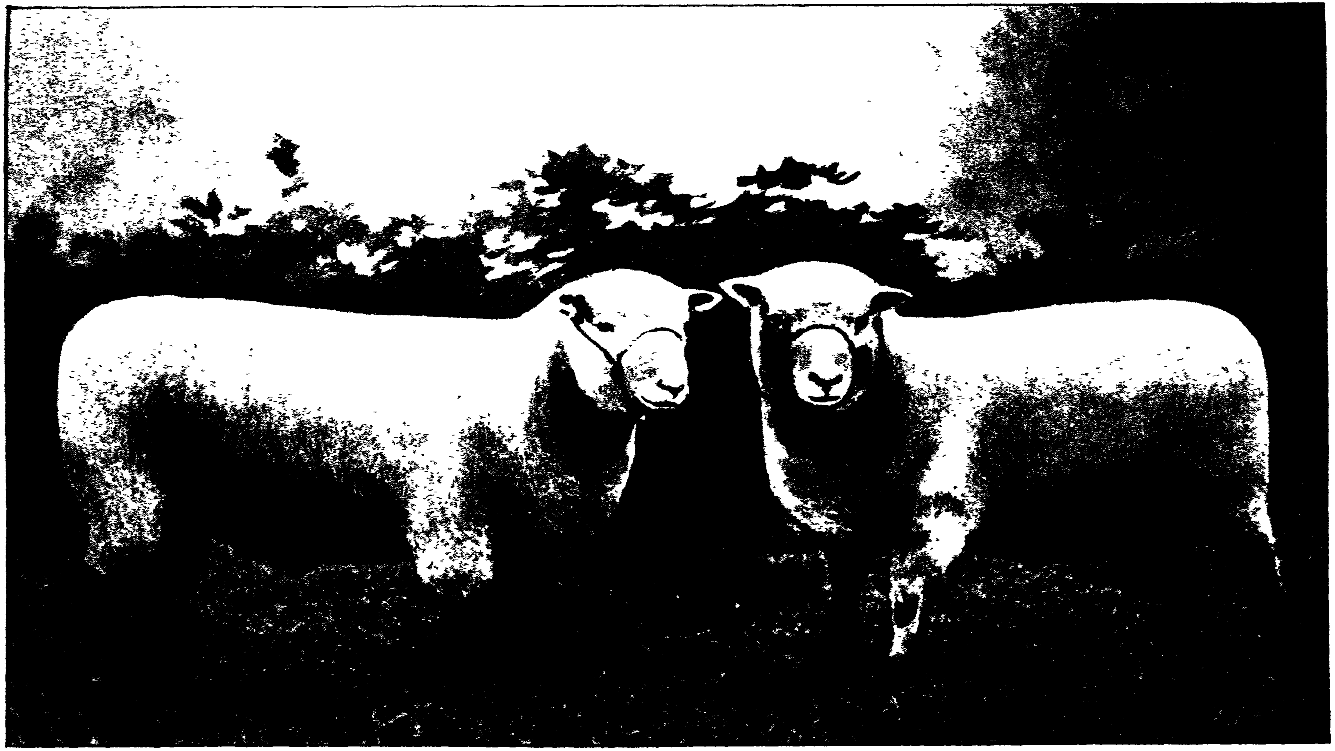
THE SOUTHDOWN.

This old English breed of sheep has been highly valued for over a century and is acknowledged by most authorities to produce the very highest quality of mutton. In the London market the Southdown mutton ranks next to Welsh mutton for highest prices, and the breed is very popular among the largest landed proprietors. The sheep are not so large as the Shropshires, but are



SOUTHDOWN RAM, "BABRAHAM BULLER"

First and Champion at Royal Agricultural Society of England's Show at York, 1900. Bred by C. Adeane, Esq.



Southdown Shearling Rams

The animal on the left is "Babraham Colonel," winner of First Prize and Champion at Plymouth, 1902, at Reading, 1902; the ram on the right is "Babraham Captain," who took Second Prize to "Babraham Colonel" at each of the above Shows. Bred by C. Adeane, Esq.

very compact, and weigh well. The forequarters are wide and deep, the back and loins broad, the body round, and the hindquarters full. The ewes are prolific and good mothers. The wool is fine and curled, but the clip is light.

The Southdowns have not received as much attention in South Australia as the Shropshire, probably on account of the carcase being smaller, and the fleece being so much lighter. There were several small flocks here some years ago, but these seem to have been dispersed. Three years ago Mr. George Sauerbier, of Wickham Park, near Kangarilla, when on a visit to the old country, purchased three ewes and a ram at the Royal Show, and landed them here in first-class condition. The ewes lambed twice within 12 months of arrival, but unfortunately the ram died about nine months after landing. One of the ewes has been exhibited at the Royal Agricultural Society's shows in Adelaide, taking first and champion on each occasion. A ram, the progeny of this ewe, has also secured the champion prize. Mr. Sauerbier stated that the Down ram crossed with Lincoln-Merino ewes gives a shorter legged but weightier sheep than the Shropshire cross, and he is quite satisfied with their development. We believe Mr. Sauerbier's is the only South Australian flock of modern Southdown

One of the most enthusiastic advocates of the Southdown for early lambs is Mr. Matthew Rankine Chairman of the Strathalbyn Agricultural Bureau Although Mr. Rankine has now retired from active labours in this connection he has had many years' experience in the raising of fat lambs for market, using both Shropshire and Southdowns, and he found invariably that the lambs showing the Southdown characteristics were the quicker to develop, and were most favoured by the butchers. Where the object aimed at is first-class carcases for freezing the Southdown is unequalled As woolproducers they do not, of course, hold a high place, but this, in his opinion, was not of much consequence; in fact, the lamb that grew meat instead of wool was the most profitable. For the London market he favoured crossing Lincoln-Merino ewes with Southdown rams. As imported this breed was undoubtedly smaller than other Down breeds, but it was noticeable that as they became acclimatized the progeny increased in size.

Our illustrations are typical specimens of Southdowns bred by C. Adeane, Esq., of Babraham Hall, Cambridge England.

ROMNEY MARSH SHEEP.

BY E. E. FEUERHEERDT.

I believe I am correct in saying that mine is the only pure bred Romney Marsh stud in South Australia. My reason for importing this breed was the name it had for extreme hardiness, being able to withstand the attacks of fluke and other internal parasites that would kill other breeds, and during the seven years that I have had them they have fully maintained their reputation in this respect. They have also clean hard feet, making them practically foot rot resistant. The sheep are of large frame, very shapely, covered with a fleece of demi-lustre wool averaging about 13 lb.

The ewes are very prolific, and make excellent mothers, and the lambs come to maturity very quickly, at three months old averaging 85 lb.

For crossing with merino this breed is unequalled, for this locality at any rate. The crossbred lambs mature early, are very shapely, strong, and healthy, and their wool is long, bright, and showy, and commands a good price. In New Zealand, where the Romney Marsh is highly prized, the crossbred lambs are much valued as freezers.

The crossbred wethers are of large and shapely frame, and grow a good fleece of wool of an attractive quality. The mutton is of excellent quality, with a large proportion of lean. And what is of the highest importance, the crossbreds are possessed of an extremely hardy constitution.

ROMNEY MARSH RAM.

Imported from New Zealand by E. E. Feuerheerdt, Esq., "Crower," Lucindale.

GROUP OF ROMNEY MARSH EWES.
Imported from New Zealand by E. E. Feuerheerdt, Esq., "Crower," Lucindale.

BLEACHED WHEAT COMPARED WITH UNBLEACHED WHEAT FOR FLOUR.

At request of Mr. W. Farrer, of the New South Wales Department of Agriculture, the Saddleworth branch of the Bureau forwarded samples of bleached and unbleached wheat, which was submitted to Mr. F. W. Guthrie, the Departmental chemist, for analysis and report. The wheats were grown by Messrs. Fitzgerald Bros., of near Auburn. The following report has been received from Mr. Guthrie:—

UNBLEACHED WHEAT.

Variety of Grain—Marshall's No. 3.

Appearance of Grain—Brownish, plump, hard, long.

Weight per Bushel—63¾ lb.

Ease of Milling - Easy to mill.

Percentage of Mill Products—Flour, 72.9; pollard, 7.1; bran, 20.0.

Nature of Flour—Colour of flour, excellent, not quite as high as bleached; strength of flour, 47.8; percentage of gluten, 9.77.

Bran fairly clean; pollard clean; break-flour, 21.9 per cent.; semolina, white and gritty.

Stripped before rain of December 16, 1902.

BLEACHED WHEAT.

Variety of Grain—Marshall's No. 3.

Appearance of Grain—Long, dull white, fairly hard and plump.

Weight per Bushel—60 lb.

Ease of Milling—Easy to mill.

Percentage of Mill Products—Flour, 68.5; pollard, 13; bran, 18.5.

Nature of Flour—Colour of flour, excellent; strength of flour (in quarts per each 200 lb.), 48; percentage dry gluten, 10.9

Bran and pollard both fairly clean, break-flour, 29.1 per cent.; semolina, white and slightly gritty. This wheat was stripped after rain. "The only respects in which the bleached grain is inferior to the unbleached are the weight per bushel and the amount of flour obtainable. The flour itself is very similar in all respects."

DEPARTMENTAL NOTES AND WORK.

The offices of the Department of Agriculture will be removed shortly to the Exhibition Building, North terrace, Adelaide, where more commodious offices are now being fitted up. When we are settled in our new quarters better facilities will be afforded to the public, and we hope to be able to give some little attention to experimental work. It is also intended to utilize the numerous works on agricultural subjects which we now possess, as the nucleus of an agricultural library to be open to the public. As funds permit standard works and records of experiments in various parts of the world will be added, and the library should prove of considerable value to agriculturists The members of the Agricultural Bureau are specially invited to make use of the library whenever they are in town.

On June 9 Professor Perkins paid a visit to Forest Range, and gave a public address under the auspices of the local Agricultural Bureau on cidermaking. There should be an opening for this industry in the hills district, as with care cider of a good quality can be made there, and we believe that there would be a demand for the beverage at a price that would pay the growers to convert their second grade apples into cider. Professor Towar has delivered lectures during June at Wilmington, Quorn, and Carrieton.

During the month Mr. Quinn has visited Kapunda and Allandale, giving pruning demonstrations in those localities. He has also continued the work of laying out the grounds at the Agricultural College, Roseworthy, and preparing to plant several acres of orchard at that institution.

During the month Mr. Thomson has been engaged in the examination of samples of milk and cheese, to discover the cause of a taint. At the Agricultural College he has given sixteen lectures and demonstrations for the four weeks, and is satisfied with the progress made by the students in the use of the Babcock test. In future all the cows will be tested weekly, and a record kept of the quantity and quality of the milk. Mr. Thomson has also visited the Woodside Factory, and intends to submit a report of his inspection to the Chairman of directors. Experiments in the cultivation of forage crops have begun at Mount Gambier, and other centres. Eight samples of milk have been received from country districts for butter-fat analysis, and five samples of butter have been tested.

During June 133 parcels of plants have been admitted into the State, and six parcels destroyed owing to not conforming with the regulations. One parcel, at the request of the consignee, was returned to its place of origin. Among these imported plants were upwards of 7,000 fruit trees. The fruits imported consisted mainly of bananas, pineapples, and passion fruits. A few citrus fruits, in the shape of Mandarin oranges chiefly, also came to hand. All told, 3,252 cases were admitted, and 65 cases destroyed overripe. The exports of fruits consisted chiefly of apples, oranges and lemons coming next in importance, making a total of 5,403 cases. Plants to the extent of 81 parcels and 2,669 packages of vegetables were also exported. The supervision of these imports and exports has occupied the time of Inspectors Brown and Rowell. Of the country inspectors, Mr. Pounsett has alone been working. He has made 128 visits to orchards and gardens in 18 days in the Penola and Coonawarra districts.

Doubtless owing to the promising opening of the season, renewed interest is being manifested in the work of the Agricultural Bureau. New branches have been formed at Wepowie, Morchard, and Virginia, and the residents of three other localities are taking the necessary steps to start branches. The members of older branches have, on the whole, showed gratifying proof of their interest in the work of the Bureau, but in a few instances the branches are apparently asleep. No reports of meetings have been received from Amyton branch since November, from Ardrossan since December, from Dawson and Hahndorf since October, Petersburg since September, Port Germein since December, and Tanunda since September, 1902. Will members of the respective branches please take note of the above, and endeavour to stir up their fellow-members to renewed activity? It would be a matter for considerable regret if we were compelled to remove the names of the branches in question from our roll.

Since the beginning of the year it has been found necessary to dispose of two of the bulls purchased some years ago by the Department for lending to the branches of the Agricultural Bureau; one bull has been destroyed, and two others have died during the period in question, and there are now only six bulls left, out of the total of 22 purchased. Taken altogether, the experiment of purchasing stock for loan to branches cannot be said to have answered expectations.

The Port Broughton Branch of the Bureau has a purebred Jersey bull which it wishes to exchange for a Shorthorn bull. The Jersey is by Fowler King, and is guaranteed a good worker. Any member of the Bureau who would like to effect an exchange in the direction indicated should communicate with Mr. J. Barclay, of Port Broughton.

COUNCIL OF AGRICULTURE.

The monthly meeting of the Council of Agriculture was held on Wednesday, June 24, there being present all members but Messrs. Bruce, Laffer, and Dawkins.

The formation of a branch of the Bureau at Virginia was approved, with Messrs. A. Hatcher, J. E. Taylor, J. Nash, W. White, S. J. Taylor, M. Maloney, J. E. Sheedy, Jos. Huxtable, G. H. Pavy, E. O. Strempel, P. Thompson, F. Odgers, J. A. Ryan, and D. J. J. Sheedy as members.

The following members were approved as members of the undermentioned branches:—Narridy, Mr. John Kelly; Davenport, Messrs. T. Hewitson and G Welby; Koolunga, Messrs. G. J. Buchanan and W. Perrin; Morgan, Mr. J. Hewitt; Morchard, Messrs. E. D. Kirkland and J. O'Loughlin; Paskeville, Mr. H. Koch; Bowhill, Messrs. E. Dragemuller and A. R. G. Dohnt; and Lyndoca, Mr. A. Springbett.

In accordance with request, the Principal of the Agricultural College reported on the question of providing instruction on agriculture for women at the College. He thought it would be a serious mistake for the department to make provision for teaching young women at the College, without ascertaining whether there is any demand for such provision. Although as previously stated the co-education system had been a marked success in the United States he had not been long enough in South Australia to decide whether public opinion here was such as to make the proposed move a wise one. He scarcely believed, however, that the time was yet ripe for inaugurating a women's course at the Agricultural College, but he could see no reason why young women could not be admitted at once as day students to take such classes as horticulture or dairying. If there were those in the State who desired such instruction, there was no reason why they should not be allowed to join the classes at any time. On the motion of Mr. Sandford, it was resolved to request the Hon. Minister to authorize the Principal to accept young men or women as day-students in the dairying course, provided he received sufficient applications from intending students to warrant such action being taken.

The annual report as drafted by the committee appointed for the purpose was adopted and forwarded to the Hon. Minister.

Professor Towar forwarded report on Mr. Miller's motion favouring the establishment in country districts of short courses of instruction on special agricultural subjects. The Professor stated that wherever this had been attempted in the United States the project had been found unworkable, and had been abandoned in favour of short special courses at the Agricultural College. It was found very much more expensive for the College to pay travelling expenses of instructors, transport of material, apparatus, &c., than to conduct the work at the institution. For much of the work special apparatus, light, movable, and yet imperfect, had to be purchased. Much of the material for instruction required months of time to prepare, and this could only be done satisfactorily at the College. The College staff have duties which demand their attention a portion of practically every day at the College. The Professor of Agriculture and other officers should not be away from the College farm as much as this work would demand. Besides this, much valuable time for which the State is paying would be lost in travelling to and from the districts where the classes would be conducted. These courses would be taken by men who may have begun business for themselves, and it would be found that they could not concentrate their minds on schoolwork when every day they were also occupying their attention partly with things of a private nature. One of the most serious objections to country classes arose from the fact that all districts could not be favoured alike. The isolated dairy district with but a few patrons could not afford to maintain a class; yet they had as much right to the instruction as the more thickly populated district. This feature naturally gave rise to jealousies and general comment. The plan which he thought would work well for this State would be to establish two short courses—one in live stock and dairying, and the other in fruit culture, viticulture, and winemaking, extending over a period of four weeks, during the regular long vacation in March and April. At this time the regular students are away, the dormitories empty, and the working staff somewhat at leisure. The expenses to the State would be so small that the tuition could be fixed at a nominal figure. The men would pay, besides the small tuition, the actual cost of their board, care of rooms, and laboratory fees. Although he had been unable to consult the other officers of the staff on the subject, he believed such a scheme could be successfully carried out. If a brief syllabus were prepared setting forth the details of the courses, promising to make the attempt should a certain number, say 25, apply, he thought it possible they could make a start by the next long vacation.

It was resolved that Professor Towar be thanked for his report, and that it be forwarded to the Minister for consideration in connection with previous resolution re day students.

Mr. Molineux called attention to the agitation for the removal of the prohibition of the sale of citrus fruit affected by scale. In his opinion it would be a great mistake to comply with this. The interests of the industry were too great to be sacrificed for relatively few growers, who could get rid of the scale by means amply demonstrated to have been successful. He moved—"That the Minister of Agriculture be asked before he finally dealt with the request to carefully consider the previous action of the department in this respect." The resolution was carried with the addition of the statement that resin wash was effective in getting rid of this insect.

On the motion of Mr. Molineux, it was resolved that the question of the necessity for a standard legal weight for the bag of chaff be again pressed under the notice of the Hon. Minister of Agriculture. The question of the adulteration of hay chaff with chaffed straw was referred to, but no satisfactory way of preventing such fraud was suggested.

On the motion of Mr. Krichauff, it was decided to recommend the branches of the Bureau to endeavour to induce the committees of the local institutes to procure standard works on agriculture, and also to ask the Public Library Board to impress on the local institutes the wisdom of spending some of their funds in this direction.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs A. W. Sandford & Company report on July 1, 1903:—

From an agriculturist's point of view the weather conditions during June could hardly have been more favourable, the rainfall being considerably above that month's average, also it was evenly distributed and of a thoroughly soaking character, so that farmers are now jubilant that their dams are filled, and winter feed assured for the stock. Meanwhile the young wheat plant is making excellent progress, more especially in the districts that had suffered from the long drought. Glowing accounts are also to hand from the Northern Areas, where pastoralists mostly report water and feed in abundance; but, as expected in such a stretch of country, some parts are yet suffering, owing the absence of rain.

There is nothing unusual to report in commercial circles, trade throughout the month having been of a steady character, with very little fluctuation in values, but during the past two or three days rumours were afloat that, unfortunately, owing to Broken Hill not participating in the break-up of the drought, a serious water famine was imminent, and upon examination the supply was found to be about exhausted, owing to the fact that the reservoirs had been silting up, so that they were compelled to at once cut off all water for mining purposes, having the immediate effect of closing the mines, which has had most depressing results upon trade on the Barrier, with thousands of miners thrown idle. Meanwhile the South Australian Government is assisting, through the railways, to at any rate help to supply the town with water for household purposes. Nothing startling to report of the new gold discoveries at Arltunga, Central Australia, but there seems now a bit better prospect of its becoming a permanent field. The weakening in value of Lead has been checked and a slight hardening set in, but this is attributed to the abrupt stoppage of the Barrier Mines. The Copper market has fluctuated somewhat, but seems to have now steadied.

Latest advices from European markets report them, though firm in tone, devoid of animation, with little alteration in prices. Californian White Wheats being reduced to a few cargoes which is held at 32/ for 500 lb. at F. and I.; but a cargo of new crop, August- September shipment, has been sold at 30/9, and Walla Walla new crop has seen business at 29/6 In England and on the Continent the weather has been cold and ungenial, and owing to lack of warmth vegetation has made very little progress. In South Australia seeding has been concluded under most favourable circumstances, and the growing crops are reported on all hands to be looking remarkably well.

Little business has been done in Wheat, though some holders cleared out their stocks at a reduction on last month's quotations. Millers' Offal.—There has been no great demand for Bran or Pollard, and quotations have declined here and in the Eastern States. The Fodder trade locally has had a quiet month's business, and, with no extra orders coming from Sydney, shipments made have only been in execution of sales previously effected. Feeding Grains are also quiet, and present quotations nominal.

In Potatoes there has been no alteration in values during the month, the low quotations being considered quite bedrock, for it is generally reckoned that farmers would not deliver at less money, as seeding operations are now on, and, also, most of the quantities available have to be carted a distance to the railway. Throughout the month the export trade to Western Australia has been more limited owing to Tasmania forcing sales at easing rates. Some few orders have been coming along from Sydney, but, unless direct steamer can be arranged for, present extra freightage hampers sales of anything like parcels. Onions are still in full supply, showing about 5/ easing on former rates.

The rains, accompanied by cold weather, especially during the early part of the month, immediately checked the steady increase of fresh Butter coming forward, causing values then to harden about 2d. per lb., which forced the trade back for their extra wants on to old lines of Stored Victorian Bulk; but with milder conditions increasing supplies are again coming along, so that the trade now is relying upon fresh prints to serve counter requirements. In Eggs the wintry weather cut off quantities to such an extent that prices sharply advanced until 1/9 per dozen loose was touched. Prices have since come back about 2d., but even at moment supplies are insufficient to fill all local export orders. Cheese.—As the season advances the range in quality widens, with prime showing a hardening. Bacon has met with steady demand, but with heavier yardings of the live animal prices have eased about ½d. The advance previously reported in Honey has restricted export orders, so that rates are scarcely as firm in this line. Almonds continue to find ready sale at full quotations.

Good supplies of Carcass Pork and Veal are coming forward, prime stuff meeting a brisk market.

Increasing quantities of Poultry have been penned, with all coops of quality selling well.

MARKET QUOTATIONS OF THE DAY.

Wheat.—At Port Adelaide, shipping parcels, 5/5, f.o.b.; farmers' lots, 5/4, on trucks, per bushel 60 lb.

Flour.—City brands, £11 15/ to £12; country, £11 10/ to £11 12/6 per ton 2,000 lb.

Bran, 10¾d. to 11d.; Pollard, 1/2½ to 1/3 per bushel of 20 lb.

Oats.—Local Algerian and Dun, 2/8 to 2/10; prime stout feeding whites, 2/10 to 3/ per bushel 40 lb.

Barley.—Malting, 4/4 to 4/8; Cape, 3/4 per bushel 50 lb.

Chaff.—£5 to £5 7/6 per ton of 2,240 lb., bags in, f.o.b. Port Adelaide.

Potatoes.—Gambiers, £2 10/ per 2,240 lb.

Onions.—Local, £2 15/; Gambiers, £2 10/ per 2,240 lb.

Butter.—Creamery and factory prints, 1/ to 1/2; private separator and best dairy, 10½d. to 1/; well graded store, 8d. to 9½d.; Victorian stored bulk, 7d. to 9d. per lb.

Cheese.—South Australian best factory, 7d. to 7½d.; ordinary, 5d. to 5½d. per lb.

Bacon.—Factory cured sides, 7½d. to 8½d.; farm flitches, 7d. per lb.

Hams.—South Australian factory, 9d. to 9½d. per lb.

Eggs.—Loose, 1/7; in casks, f.o.b., 1/9 per dozen.

Lard.—In bladders, 6½d. to 7d.; tins, 6d. to 6½d. per lb.

Honey.—2¾d. for best extracted, in 60-lb. tins; Beeswax, 11d. lb.

Almonds.—Fine soft shell, 5d.; kernels, 10½d. per lb.

Carcass Meat.—Prime porkers, from 5d. to 6d. per lb.; medium to good baconers, 4d. to 5d.; light and rough choppers, 3d. to 4d.; prime veal, 3½d. to 4½d.; medium to fair, 1d. to 2½d.

Poultry.—Dressed turkeys and fowls, 5½d. to 6½d. per lb. In live birds, nice table roosters are worth 1/10 to 2/3 each; good hens and fair cockerels, 1/2 to 1/6; poor and light, 8d. to 10d.; ducks, 1/10 to 2/6; fair to good geese, 2/3 to 2/9; pigeons, 4d.; turkeys, from 4d. to 6½d. per lb, live weight, for fattening to good table sorts.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are city auction mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of June, 1903:—

Adelaide	3·87
Hawker	1·07
Cradock	1·07
Wilson	1·50
Gordon	0·75
Quorn	0·97
Port Augusta	0·48
Port Germein	1·42
Port Pirie	1·50
Crystal Brook	2·51
Port Broughton	1·91
Bute	3·25
Hammond	0·60
Bruce	0·42
Wilmington	1·62
Melrose	2·06
Booleroo Centre	1·58
Wirrabara	2·55
Appila	1·78
Laura	3·11
Caltowie	2·37
Jamestown	2·68
Gladstone	2·49
Georgetown	2·62
Narridy	3·00
Redhill	3·49
Koolunga	2·46
Carrieton	0·81
Eurelia	1·12
Johnsburg	0·75
Orroroo	1·15
Black Rock	1·20
Petersburg	1·35
Yongala	1·59
Terowie	1·28
Yarcowie	1·59
Hallett	2·53
Mt. Bryan	2·26
Burra	2·28
Snowtown	2· 2
Brinkworth	1·72
Blyth	2·39
Clare	3·51
Mintaro Central	4·06
Watervale	4·20
Auburn	3·06
Manoora	3·20
Hoyleton	2·40
Balaklava	2·24
Port Wakefield	2·25
Saddleworth	3·26
Marrabel	3·13
Riverton	3·73
Tarlee	2·26
Stockport	2·53
Hamley Bridge	2·82
Kapunda	3·48
Freeling	3·88
Stockwell	3·31
Nuriootpa	4·18
Angaston	4·93
Tanunda	3·80
Lyndoch	4·32
Mallala	2·99
Roseworthy	3·37
Gawler	3·55
Smithfield	3·63
Two Wells	2·83
Virginia	2·90
Salisbury	3·11
Tea Tree Gully	4·65
Magill	4·35
Mitcham	4·56
Crafers	7·96
Clarendon	6·33
Morphett Vale	3·65
Noarlunga	3·88
Willunga	4·26
Aldinga	3·50
Normanville	4·08
Yankalilla	4·00
Eudunda	2·69
Truro	3·55
Mount Pleasant	3·16
Blumberg	5·04
Gumeracha	6·00
Lobethal	6·18
Woodside	4·20
Hahndorf	5·57
Nairne	3·83
Mount Barker	5·38
Echunga	4·99
Macclesfield	5·83
Meadows	5·67
Strathalbyn	2·53
Callington	3·07
Langhorne's Bridge	1·90
Milang	2·39
Wallaroo	3·01
Kadina	3·43
Moonta	3·14
Green's Plains	2·77
Maitland	3·99
Ardrossan	1·89
Port Victoria	2·69
Curramulka	4·49
Minlaton	3·21
Stansbury	2·34
Warooka	2·02
Yorketown	2·86
Edithburg	1·92
Fowler's Bay	1·10
Streaky Bay	2·13
Port Elliston	3·96
Port Lincoln	3·55
Cowell ...	1·75
Queenscliffe	2·45
Port Elliot	2·75
Goolwa	2·60
Meningie	3·48
Kingston	4·51
Robe	4·94
Beachport	6·17
Coonalpyn	2·17
Bordertown	2·16
Frances	3·35
Naracoorte	4·05
Lucindale	4·05
Penola	4·92
Millicent	5·36
Mount Gambier	5·90
Wellington	2·70
Murray Bridge	1·92
Mannum	1·23
Morgan	0·73
Overland Corner	1·01
Renmark	0·79

AGRICULTURAL BUREAU REPORTS.

Bute, June 9.

Present—Messrs. Brideson (chair), Sharman, Ebsary, Stevens, Hamdorf, Gitsham, McEvoy, and Trengove (Hon. Sec.).

Annual Report.—Eleven meetings have been held during the year, with an average attendance of 11 members and several visitors. Three papers read, and these, with several papers by members of other branches, have been well discussed.

Hay from Manured Land.—Members disagree with statement from Eudunda that manured land produced hay of inferior character.

Stump-Jump Ploughs.—Mr. Hamdorf stated in reply to query from Booleroo Centre Branch that the stump-jump plough was the invention of a mechanic.

Storing Manures.—Some discussion ensued on best way to stack manure which has to be stored for any length of time. Members were of opinion that there would be less loss if the manure was stacked loose in a moisture proof building than if stacked in bags around which the air would pass freely.

Colton, June 6.

Present—Messrs. P. P. Kenny (chair), M. S. W. Kenny, Whitehead, Hull, Barnes, and Packer.

Annual Report.—Six meetings have been held, with an average attendance of seven members and three visitors. Several papers have been read, and with various subjects brought forward for discussion, the meetings have proved interesting and instructive. Members expressed regret that more interest was not taken in the branch work by the residents generally. Mr P. P. Kenny was re-elected Chairman, and Mr. W. J. Packer elected Hon. Secretary. A vote of thanks was accorded to Mr. R. Hull for his services as Hon. Secretary during the past 11 years, also to Mr. M. S. W. Kenny for providing meeting room, lights, &c.

Machinery at Adelaide Show.—Mr. Packer gave an interesting account of various farm implements seen at the Adelaide Show, especially the complet harvesters. A very interesting discussion took place.

Booleroo Centre, June 9.

Present—Messrs. Nottle (chair), Dr. Steven, Repper, Brooks, Michae Murdock, Sargent, Clack, McMartin (Hon. Sec.), and one visitor.

Annual Report.—Eight meetings held during 11 months since previous report; average attendance, nine members and three visitors. Four papers have been read, and the meetings generally have been interesting. The full membership roll is kept up; whenever any member drops out there is always some one ready to accept the vacant position. Messrs. N. Clack, W. Brooks and F. McMartin were elected Chairman, Vice-Chairman, and Hon. Secretary respectively.

Mount Pleasant, June 19.

Present—Messrs. Phillis (chair). Lyddon, Royal, Maxwell, Tapscott, Godfree, Miller, Vigar, and Giles (Hon. Sec.).

Annual Report.—Eight meetings held during the year, with an average attendance of 7.5 members out of 14 on the roll. Only one paper had been read during the year. Messrs. G. Phillis and G. A. Vigar were elected Chairman and Hon. Secretary respectively. It was decided that at July meeting discussions be held on "How to make a living on 80 acres" and "Large v. small grain for seed."

Mallala, May 4.

Present—Messrs. Worden (chair), Nairn, W. and S. Temby, Churches, Jenkins, Moody, and Stephenson (Hon. Sec.).

Feeding Horses.—Mr. W. R. Stephenson read a short paper on this subject. No hard and fast rule can be laid down, but every man must be largely guided by his own special conditions and by his horses. One horse will do well on a moderate amount of food, another will require considerably more, and some are never satisfied. There was no feed of equal value to oats for horses. Good sound wheaten hay was excellent. To save waste it should be chaffed. The hay should not be too ripe, as in that condition it is heating. When the horses are not in full work they might get cocky chaff mixed with hay chaff and a little oats. As much variety of food as possible should be given. Where lucerne or clover can be grown it should be fed to a reasonable extent. Where succulent food cannot be provided it is well to feed some bran. Always keep a lump of salt in the manger, and see that there is a plentiful supply of good water. He had the water laid on at his stables and yards, so that the animals can go to it whenever they want it. Mr. Churches said regular hours of feeding was an important factor. He let his animals feed for three hours before taking them out to work in the morning, but Mr. W. Temby considered one hour sufficient on short feed when they had been well fed overnight. He considered it best to steam the oats and pour water on the chaff. He liked to feed overnight on long hay, and preferred Cape oats to any other kind. Mr. Moody considered that the diet should be better regulated. It was immaterial whether oats were fed crushed or whole. He found cattle did well on molasses mixed with chaffed header straw: the addition of a little treacle was an improvement. Ripe hay was not so suitable as green hay for old horses, though if cut at the proper state it contained more saccharine. Mr. Nairne preferred oats to anything else. He generally fed chaffed oaten hay, filling the mangers at night and letting the animals run loose. In the morning he gave a smaller amount of chaff, with some crushed oats. Long hay was wasteful.

Willunga, June 6.

Present—Messrs. Blacker (chair), Richards, Atkinson, Allen, Vaudry, Brown, Kernich, and Hughes (Hon. Sec.).

Binding Banks of Creeks.—Discussion on this subject took place. Members recommended blackberry bushes, willows, and couch grass

Feeding Farm Horses.—Good hay chaff and whole oats were most in favour for feeding working horses.

Mount Compass, June 13.

Present—Messrs. Jacobs (chair), Arthur, Cameron, Gowling, Hutton, Herring, Jenken, Klauss, Slater, Peters, Sweetman, F. and H. McKinlay, and one visitor.

Annual Report.—Twelve meetings have been held during the year, with an average attendance of 12 members. Five papers have been read, and a number of practical discussions initiated by members. The second annual show in connection with the branch was very successful. Messrs. M. Jacobs, R. Cameron, and H. McKinlay were elected Chairman, Vice-Chairman, and Hon. Secretary respectively for ensuing year.

Cowpock.—Members wished to know how to treat complaint in cows' udders called locally "cowpock." [Mr. C. J. Valentine advises bathing twice a day with warm water, and applying vaseline or other ointment that will keep the skin soft.—Ed.]

Wattles on Sandy Soil.—Mr. Hutton initiated discussion on the growing of wattles on the sandy rises, and the best means of clearing the scrub, &c.

Crystal Brook, June 6.

Present—Messrs. Pavy (chair), G. and G. M. Davidson, Venning, Hamlyn, Hutchinson, and Miell.

Agricultural Motors.—Discussion on this subject took place, members being of opinion that eight-horse power motors would not be strong enough for use on Australian farms, but motors of 20 to 32-horse power should be useful.

Rugging Cows.—Members were of opinion that rugging the cows during cold wet weather would prove beneficial and result in an increase in the milk supply.

Management of Horses.—Mr. H. Hamlyn read a paper on this subject. It was a mistake to work horses for too long hours on the farm; 7½ hours to 8 hours a day was long enough for such work as ploughing or scarifying, as the draft is continuous. Horses worked for longer hours soon get slow, and after a few weeks' work will get through far less ploughing in a day than when they started; in fact horses working shorter hours will keep in better condition and actually do more work from beginning to end of the ploughing season than horses working longer hours. Working horses early on cold mornings or late on frosty evenings is bad for them; they go into the stable wet with sweat, and scarcely get dry during the night. In driving horses long journeys in light vehicles, they should be driven steadily for the first two or three days; if this is done they will travel much better afterwards than if driven fast at the start. On the question of feeding horses, he entirely agreed with Mr. John Hill's system, as outlined in the May issue of The Journal of Agriculture, except in regard to watering. He considered it a mistake to let them have free access to water directly they are taken out of harness. He considered this a very unsafe practice, especially with brood mares, as drinking freely directly after working will probably cause them to slip their foals. His experience was that it was best to let the horses have a little water when knocking off work; then, in half an hour's time, or even an hour, let them have free access to drinking water. He noticed in one of the local papers an article by Mr. H. Castle, of Blanchetown, in reference to sore shoulders in horses. He advocated soaking the collar in water all night, and in the morning fitting it to the horse's shoulders, and using for light work while still wet. To harden the skin on young horses he suggested washing the shoulders with brine after working them.

Golden Grove, June 11.

Present—Messrs. Milne (chair), McPharlin, Harper, Buder, Woodhead, Ross, Angove, Maughan, N. J. and A. D. Robertson (Hon. Sec.).

Rugging Cows.—Mr. Maughan was the only member who had tried rugging dairy cows, and he had proved that a cow will produce more butter on less food if rugged and warmly housed in winter than she will if turned out. Several members intimated their intention of adopting the practice of rugging cows.

Diseases of Fruit Trees.—Mr. T. C. Angove read a lengthy paper on fruit tree diseases and their treatment. He dealt with the different classes of diseases, the causes of same, the methods of propagation, &c. The necessity for knowledge of the chief characteristics of the different pests in order to know what steps to take to combat them was emphasized. The different formulae for spray compounds were mentioned. In the making of Bordeaux Mixture Mr. Angove stated that water should be added to the concentrated solution until the blue tinge had quite disappeared. Mr. Maughan took exception to this statement: he had used large quantities of Bordeaux Muxture, and had never seen it without a decided blue tinge. [Bordeaux Mixture made according to the recognised formula should be decidedly blue in colour; when treacle is added it becomes green.—Ed.] Considerable discussion took place on the different methods of dealing with insects, especially the codlin moth, and it was decided to further discuss the codlin moth question at next meeting.

Onetree Hill, June 12.

Present—Messrs. J. Bowman (chair), F. and G. Bowman, Ifould, Thomas, and Clucas (Hon. Sec.).

Green Fodder.—Discussion on this subject took place. Rape and mustard were highly recommended. A member had found cows to improve much quicker on rape than on green cereals. The aeration of the milk would remove the taint caused by rape. This food should be fed sparingly at first in order to avoid hoven. Crops like rape and mustard grew better on land manured with stable manure than with mineral phosphate. Mr. Ifould scarified a lucerne paddock, and sowed barley; he got two cuts of winter feed, and in the summer the lucerne grew splendidly. To promote the growth of lucerne it was necessary that the surface of the soil should be broken up; for this a narrow-tined cultivator or disc-harrows would be best. Where grass had grown freely in the lucerne patch it would be found beneficial to fire it; on poor soils an application of bone super would be found useful.

Deficiencies in Fertiliser Guarantees.—Attention was called to published analyses of commercial fertilisers, showing serious discrepancies between the guarantees and the official analyses.

Papers Read at Branches.—Following the suggestion made at previous meeting by the Hon. Secretary, that members should mention any paper in the Journal that they considered of special merit, three different members had made a note of Mr. Jacobs's paper on "Duties of Members" read at Mount Compass Branch, and one member had selected the paper by Mr. Smallacombe, of Narridy, on "Management of Horses."

Mylor, June 15.

Present—Messrs. W. Nicholls (chair), J. Nicholls, Narraway, Mundy, Bradley, E. J. and T. G. Oinn, Smith, Neilson, Hughes (Hon. Sec.), and two visitors.

Annual Report.—The Hon. Secretary's report showed nine meetings held, with an average attendance of eight members out of 13 on the roll. Three papers have been read and discussed, and he was pleased to be able to report that scarcely a meeting had passed without a number of samples being tabled. He would like every member to realize the importance of showing exhibits of local produce, and also explaining anything special in connection with them. It was decided that in future the meetings be held in Longwood Institute, and also that the department be asked to sanction the alteration of the name of the branch to Longwood. A vote of thanks was accorded to Mr. Mundy for use of room during past three years.

Potato Experiments.—Mr. T. G. Oinn called attention to report in Journal of Agriculture of experiments carried out at Mount Compass. Some discussion ensued, members generally being of opinion that not much reliance could be placed upon a single test. To secure information of value it would be necessary to carry out tests for several years. It was the general practice here to use small whole setts in preference to large cut seed. Better returns this year have been secured from Redskins than from Prolifics, especially in the late crops. Mr. Oinn stated that Hero potato, imported some years ago through the Central Bureau, appeared to stand more frost than any other variety he had grown, and was also resistant of "black spot."

Bitter Pit.—Attention was called to paper read at Forest Range Branch by Mr. J. Vickers on "bitter pit" disease of apples. Members agree entirely with the writer of the paper. It was noticed that the disease develops quicker if the fruit is gathered than if left on the trees.

Quinces.—Mr. Hughes tabled two samples of jelly made from quinces tabled at previous meeting. The jelly from pear-shaped quince was not as rich in colour as that from Portugal quince, but members differed in the opinions as to quality. Several other samples were tabled, including peach jelly by Mr. Oinn, and an elaborately carved eggcup made from the wood of tree-lucerne (Cytisus proliferus). The wood was like oak in appearance, and members thought it would be capital for ornamental turnery work.

Paskeville, June 13.

Present—Messrs. Goodall (chair), Pontifex, Macdonald, J. C., T. H., and S. R. Price, Meier, O'Grady (Hon. Sec.), and one visitor.

Sore Shoulders.—In reply to enquiry by member of another branch, Mr Pontifex stated that he purchased a horse with a sore shoulder, which it was stated was incurable. He procured a piece of sheepskin, and sewed it on to the collar, with the wool against the collar. The sore soon got nearly well, when he cut a patch in the sheepskin immediately against the sore, leaving it partly hollow, owing to the padding made by the skin and wool around it; this permitted the sore to heal up The Chairman's experience was that a soft collar was more likely to cause sore shoulders than a hard one; and he always keeps the collars hard, but lined and sound, no soft padding being used. Mr. Macdonald also found newly padded collars gall the shoulders.

Stone Gatherer.—The Chairman called attention to discussion at Wilmington Branch in reference to an implement for gathering stones in the fields. Members consider that such a machine if offered at a reasonable price would be of great value. What was wanted was a machine which, after the large stones had been removed, would gather up the smaller stones in heaps or rows, whence they could be removed by drays. The branch is prepared to contribute towards proposed fund as suggested by Wilmington Branch.

Brinkworth, June 6.

Present—Messrs. Everett (chair), McEwin, Morrison, Jericho, Russell, Hill, Ottens, Welke, and Stott (Hon. Sec.).

Lime and its Uses.—Mr. A. L. McEwin read a short paper on this subject. Lime was an effective destroyer of much disease and vermin, and it was to be regretted that it was not more largely used, being one of the cheapest and safest disinfectants to use. It would prevent bad smell without creating, as some disinfectants do, an effluvium worse than the original smell. Lime should be used freely about the fowlhouses and pigstyes, and especially in the closets: at all public urinals it should be used. If a plentiful supply is used in the ordinary cesspits, the latter will be found no more objectionable to clean than an ordinary stable; he believed also the free use of lime would destroy disease germs. As a fertiliser, he doubted its value in this locality, except where the land is wet and cold, where it could be applied with advantage. Lime should also be more freely used in the erection of farm buildings, He had often been struck with the poor character of the outbuildings at the homesteads of many well-to-do farmers, even where stone was plentiful. It was true that stone buildings were more expensive to erect, but they were practically everlasting. They were pleasant to the eye, more comfortable for stock, and in every way more satisfactory for housing valuable machinery. He was under the impression that free access of wind was quite as injurious to the machinery as exposure to heat and cold. It was his ambition to have all his outbuildings of stone, and only the distance he had to cart the stock checked his work in this direction. Paper was well discussed, members being generally of opinion that lime should be more freely used as a disinfectant, and it was also thought advisable to apply lime occasionally to their red soils. Mr. Everett stated that a friend of his used limewater as a cure for bloat or hoven with much success.

Cherry Gardens, June 9.

Present—Messrs. Woods (chair), C. and J. Lewis, Burpee, Broadbent, Wright, Hicks, Potter, Ricks (Hon. Sec.), and one visitor.

Branch Show.—Matters in connection with the usual show of products held in connection with the branch were discussed, and it was resolved to enlarge the scope of the show and make it a district show.

Lucindale, June 13.

Present—Messrs. Feuerheedt (chair), Dow, Matheson, Beaton, and Dutton (Hon. Sec.).

Planting Citrus Trees.—In reply to question the Chairman advised planting orange trees not later than June or July, earlier if possible, in this locality. All useless wood should be pruned out, brush erected on the windward side, and some slight covering above the tree to protect the young growth from frost.

Poisoning Foxes.—Discussion on this subject took place. Mr. Dow thought birds would be the best baits, as they would not be so likely to be taken by the sheep dogs. Others thought the foxes would take liver more freely than birds; it had on several occasions been noticed that buried baits had been scratched up and left by the foxes, but afterwards taken by the animals. It was agreed that vigorous action was necessary to keep down the foxes, which were doing considerable damage in some parts to lambs and poultry.

Rhine Villa, June 5.

Present—Messrs. G. A. Payne (chair), W F Payne, Farey, Mickan, Hecker, Lewis, Schick, Pannach, Start, W. F. and J. W. Vigar (Hon. Sec.), and one visitor.

Wheatgrowing. It was agreed that the condition of the soil secured by cultivation was almost the most important item in cropping land Members thought that unless it was intended to crop the land again, it was best to let the stubble rot on the ground: if a second crop is to be grown, the stubble should be burnt, as ploughing it under keeps the soil too open. The Hon. Secretary questioned the wisdom of cropping land in this locality two years in succession, but Mr. Pannach thought it was all right if manures were used Mr. Hecker thought they might be able to grow early green feed on the stubbles by sowing barley or other grain with a disc drill. The Hon. Secretary had tried white mustard on fallow for two years without success.

Watervale, June 8.

Present—Messrs. Treloar (chair), Holder, Perrin, Solly, Scovell, Ashton. Smith, and Castine (Hon. Sec.).

Land for Apples and Pears.—Mr. Treloar tabled samples of Winter Nelis pear grown on different kinds of soil, and discussion ensued. Members found by experience that apples and pears grown upon high ground keep better than fruit produced on the flats. Members reported that the season had been very favourable from the point of view of the orchardist, and there was every prospect of the subsoil receiving a thorough soaking this winter.

Stockport, June 8.

Present—Messrs. Watts (chair), Stribling, Godfree, Megaw, Smith, Howard, Bransom, and Murray (Hon. Sec.).

Annual Report.—The Hon. Secretary read eleventh annual report, which showed that during the past year 10 meetings had been held with an average attendance of six members. The attendance was not satisfactory, and he hoped that there would be considerable improvement during this year. Three papers had been read, a public social gathering held, and various matters of practical interest discussed. Messrs. A. Bransom, T. Howard, and J. Murray were elected Chairman, Vice-Chairman, and Hon. Secretary respectively.

Gawler River, May 8.

Present—Messrs. H. Roediger (chair), F. Roediger, Barritt, Krieg, Leak, Winckel, Badcock, Hillier, and Bray (Hon. Sec.).

Selling Produce.—Mr. A. Bray read a short paper on "How our methods of selling produce might be improved on." The first item referred to was eggs. It seems a very unfair method to sell eggs by the dozen, unfair both to buyer and seller. Eggs vary considerably in size. Some are almost double the size of others, and consequently worth to the consumer double as much· and yet if you take them to the store you are paid as much for the small as for the large ones. If a farmer keeps fowls merely for egg production there is no encouragement whatever to keep hens which lay large eggs. The eggs of the smallest fowls will bring the same price in the market, and small birds consume less food than the larger ones. If eggs were sold by weight it would be fairer for all parties—the fowlkeeper would receive what he was entitled to, and it would be much more satisfactory to the purchaser. The trouble of weighing would, if many were to be handled, be much less than that of counting. One bone of contention between growers of green peas and greengrocers is that of the method of judging a bushel. A great many growers to save time weigh their peas, allowing 28 ℔. to the bushel, which is the recognised weight. The retailer, on the other hand, sells them out by the peck measure. If the peas are not particularly well filled he finds that 28 ℔. will run the four pecks, but if well filled that 28 ℔. will not fill a bushel measure, and consequently the greengrocer finds himself short. If 28 ℔. is the recognised weight of green peas—as 60 ℔. is of a bushel of wheat, even though it fails to fill a bushel measure—then the fairest way would be for greengrocers to sell 7 ℔. to the peck instead of filling a peck measure. The consumer would come out all right, as the weight is, after all, a more correct gauge of the contents than measurement. Then, in fruits there is a lack of system in retailing. Some varieties of fruit are sold by the dozen, others by the pound. He was informed that in Sydney almost all varieties of fruit are sold by the dozen, even tomatoes. On the other hand, in the West, or at any rate some parts of it, all fruits and vegetables are sold by weight; the latter is much the more desirable way. Why should not oranges be sold by the pound instead of the dozen as well as apples? Any one accustomed to handling oranges knows that the weight is a sure test as to the quality of the fruit. The uninitiated, judging by the size, are often deceived. An orange with a thick puffy rind appears much larger than its contents warrant. Put it in the scales and its deficiencies are at once apparent. Some years ago they marketed a great many oranges by weight, at so much the cwt. instead of the case, and it answered very well. There is always a certain amount of prejudice against innovations, but once adopted he was sure weighing would give satisfaction. The same thing applies to all classes of fruit. Apricots and peaches are sold by weight a great deal more than they were a few years ago, and it is in everything much the fairer way. Then, again, cabbages, cauliflowers, vegetable marrows, trombones, and cucumbers might all be sold by weight. When once people got accustomed to the idea the fairness of the system would commend itself to them. The uninitiated are the sufferers by the present haphazard system, while the one recommended is fair to all and unjust to none. Members discussed the paper and considered the putting into practice of the suggestions set forth to be desirable. The following resolution was carried unanimously:—"That this meeting approves of the suggestions brought forward in the paper."

Balaklava, June 13.

Present—Messrs. Manley (chair), Anderson, Reid, Thompson, Smith, Robinson, Neville, Hams, Baker, Burden, Johnson, Thomas, Black (Hon. Sec.), and several visitors.

Horsebreeding.—Mr. Thomas read from August, 1901, Journal of Agriculture a paper on this subject, which was well discussed, and almost unanimously approved of.

Mount Bryan East, May 23.

Present—Messrs. Dunstan (chair), Honan, Dare, Bryce, T. Wilks, Teddy, Quinn Taylor, Thomas, Pohlner, E. Wilks (Hon. Sec.), and several visitors.

Stallion Tax.—Considerable discussion on this subject took place, and a resolution opposing proposal was carried.

Rail Freights.—Members thought that the rail freights on manures and chaff should be reduced, and it was decided to ask the other branches to support a request in this direction.

Rape for Early Feed.—Mr. Bryce stated that in February he sowed rape on a portion of his stubble paddocks, and now had a fine growth at least a foot in height. His stock were grazing on the land, and seem to relish the rape.

Preserving Grapes Fresh.—Mr. Quinn tabled sample of fresh grapes which had kept sound and good for several weeks by enclosing them while on the plants with a paper bag.

Gumeracha, May 11.

Present—Messrs. Moore (chair), Foote, A. E. and W. A. Lee, Hannaford Bond, Hanna, Monfries, Cornish, Kitto, and Stephens.

Sheep.—Mr. Foote read a paper on management of sheep and classification of wool. Every farmer who has sufficient land will find it profitable to combine grazing with wheatgrowing and dairying. Care and judgment must be exercised in the selection and management of sheep; also whether fat sheep or wool should be the object. He thought it would be more profitable to combine the two. Many farmers are opposed to sheep for fear of running their cows short of feed, and while he strongly opposed overstocking he knew that many acres of good sheep feed were wasted annually. The tilling ground, for instance, can be grazed by cattle for a few weeks after harvest, but the stinkwort becomes objectionable to them, whereas sheep will do well on such land, and will help to clear the stinkwort, bogweed, and other weeds on cultivated land. He was a strong advocate of fattening sheep and lambs for market, believing that as far as this locality was concerned it would pay better than either breeding or keeping sheep for wool. He thought that if the land now used for haygrowing was sown to lucerne, rape, or English clover for fattening sheep it would be more profitable than haygrowing, and would entail less labour. In a district like this almost any class of sheep will fatten and every week the wool is increasing in value. He thought it most profitable to buy lambs, as it is generally possible to purchase them cheaply in districts where they cannot be fattened, or where they are too far away from the market to sell as fats, and in consequence are offered for sale at low rates. The trade in frozen lambs has given a fairly certain market at satisfactory prices, and while the lambs do not require so much feed as grown sheep, they will average as much profit per head. Other than lambs he would not advise purchasing young sheep to fatten. Two-tooths do not do so well, require better feed to fatten on, and have not the weight of mutton that older sheep carry. A full-mouthed wether could not be beaten for fattening purposes, the merino or merino comeback for preference. Of late years, however, owing to high prices prevailing, it has been difficult to purchase aged wethers, six-tooths being the oldest sheep on the station. Although ewes do not find so ready a sale as wethers they can be made to return a good profit to the grazier; even broken-mouthed sheep will fatten if there is plenty of food. The only sheep he found not to do well with him were sheep from the far north; they seem to require 12 months to become acclimatized before they will fatten, except on lucerne or other green stuff. He had known sheep from the far north brought on to one of the best farms in the district nearly fats, and sold 10 weeks after as stores. Where the land is not suitable for fattening sheep, breeding and woolgrowing can be made to pay. For this he was a strong believer in the merino, and where the sheep are kept for breeding would advise having the lambs dropped in April, in order that they may be strong before the cold winter nights set in. Crossbreds will stand cold better than pure merinos. For fat lambs he advised crossing merino ewes with Shropshire, Lincoln, or Dorset Horn rams, but for wool he preferred the robust type of merino pure. The all important question of woolclassing must be referred to, though it is impossible to deal with it at any length. Most of the members of the Bureau who keep sheep are farmers, and their flocks were not large enough to justify scientific classing. The farmer is, however, in no way exempt from the necessity for paying proper attention to the get up of the wool. As a matter of fact he suffers proportionately a greater loss than the larger owner from negligence in classing and packing his wool, as small lots of farmers' wool rarely realise the same price as larger parcels of the same quality, and if badly got up they will only be bought up at low rates by speculative scourers, who expect to sell again at a good profit. It is to be regretted, therefore, that so many farmers send their wool to market in such bad condition. It seems most peculiar that the farmers who pride themselves on the good quality of their sheep, and on the care and attention paid to them, should very often fall into the fatal error of bundling all the wool together. No sane man would advocate farmers employing a skilled expert; care and commonsense only are necessary. Some of the most usual failings are—fleeces, skirts, bellies, pieces, locks, &c., all together; allowing the wool to get dirty or mixed with chaff; tying with string or binder twine; bales packed too loosely. The following suggestions, if acted upon, will accomplish all that is required of the small sheepowner:—The shearing must be done on a clean floor; the fleeces when thrown on the rolling table ought to be skirted very lightly, only take off the ragged edges and stained wool; roll the fleece neatly from breech to shoulder, and never use string for tying; the wether bellies ought to have the pizzle stains taken off, and should be dried and packed with the other stained wool; pack bellies, pieces, locks, and stains separately, as mixed lots seldom bring their own value.

Lyndoch, June 4.

Present—Messrs. Kennedy (chair), Ross, Warren, Ren, Springbett, and Mitchell (Hon. Sec.).

Red Scale.—Mr. Warren drew attention to report of deputation that recently waited upon the Hon. Premier asking that the restrictions upon the sale of citrus fruits affected by red scale should be removed. Mr. Warren pointed out how the red scale injured the trees and disfigured the fruit, and considered it would be unfair and dangerous to owners of clean orchards to permit of the widespread distribution of scaly fruit. Steps should rather be taken to check the spread of the pest than remove the restrictions on its distribution. Members generally agreed, and it was resolved that Mr. Warren represent the branch upon any deputation arranged to protest against the sale of scaly fruit being allowed. Members consider that fruit tree nurseries should be visited periodically by an inspector of fruit, and that publicity should be given in the Journal of Agriculture to the condition of the different nurseries in respect to freedom, or otherwise, from disease. It was also thought that something should be done to ensure trees being sold true to name.

Woolundunga, May 13.

Present—Messrs. Michael (chair), Greig, Bently, Prosser, Aldenhoven, Walker, and Rogers (Hon. Sec.).

Irrigation.—Members met at residence of Mr. Walker, and an enjoyable time was spent inspecting matters of interest. Various matters were discussed, including washing of land by flood waters, grading of land for irrigation, cultivation after irrigation, and other points connected with fruitgrowing. After the inspection members were entertained at tea by Mr. and Mrs. Walker, who were thanked for their hospitality.

Officers.—Mr. T. H. Prosser was elected Chairman and Mr. W. Rogers re-elected Hon. Sec.

Kanmantoo, June 5.

Present—Messrs. T. Hair (chair), F. Hair, Mills, R. and J. Downing (Hon. Sec.).

Horse v. Motor Power.—Discussion took place on circular re Ivel agricultural motor. Members were of opinion that the time was not far distant when a large amount of the heavy work on the farms would be carried out with motor power, and desired further information as to cost, &c.

Manuring of Pastures.—Mr. Mills reported that the grass on the manured experimental plots was already showing an advance on the grass on the unmanured plots.

Tilling.—Some discussion ensued on the treatment of the soil before and after seeding. Mr. F. Hair referred to the advantage of rolling before seeding to secure a good seedbed. He found the plant got a better start where this was done. Members did not approve of rolling after drilling or sowing, as their experience was that the young plant benefited by the shelter given by the irregular surface.

Ringing Currant Vines.—The effect on the yield and quality of currants due to ringbarking of the stem of the vine was referred to. The increased yield was acknowledged, but some members stated that dealers had complained that the currants from the treated vines were not so even nor so well flavoured as those from untreated vines. Members would like to know if there was any foundation for the statement that the ringing of the vine affected the quality of the fruit.

Arthurton, June 10.

Present—Messrs. W. H. Hawke (chair), Short, Rowe, Lamshed, Welch, Pearson, Baldock, Palm (Hon. Sec.), and several visitors.

Pickling Barley.—The Chairman reported an experiment in pickling barley in hot water, viz., 130 F. Although this method entailed considerable trouble he was of opinion it would prove effective in preventing bunt.

Shortweight Manure.—Mr. Short reported having weighed three different kinds of manure, five bags of each, with the result that the totals were 859 lb., 890 lb., and 896 lb., or 171 4-5 lb., 178 lb., and 179 1-5 lb. respectively in bags alleged to contain 2 cwt. Members considered this very unsatisfactory, and it was decided that the members should refuse to take delivery of manure unless the bags held full weight. [The discrepancies shown above are so great, amounting to 25 per cent., that it is difficult to believe that no mistake has been made. The matter is, however, of too great importance to farmers to be allowed to pass, and should be thoroughly enquired into.—Ed.]

Bureau Meetings.—Mr. J. B. Rowe read a paper on how to create a more active interest in the Bureau work, and a more regular attendance of members. They all knew how it took the spirit out of any organization when the majority of the members failed to attend regularly, or showed no interest in the work in hand. In too many cases some small matter occurs which is permitted by the members to cause their absence, and their excuse to themselves will be that "So-and-so will be present, and I shall not be missed." They forget that their presence alone is a stimulus to the other members. Some do not take an active part in the meetings because they are afraid they may not do so well as others. He would say let every member make it his duty to attend regularly, and bring forward any information they think likely to be of value, and offer any suggestion for improving their methods. There was no need for discouragement if it did not meet with immediate adoption or approval of their fellow members; they could have the satisfaction of knowing that in all probability some one or other would benefit from the publicity given it. They had instances every day of this. He might mention one; a friend of his when a lad, had a horse that would kick anything or anybody who touched her, and tried all he could, without success, to break her of the habit. Speaking about it one day to a friend, the latter said he had seen it stated that if a bag of chaff were hung up so that it would just touch the animal she would kick until she was tired without getting rid of the cause. This remedy was tried and proved a complete success. Probably the man who first suggested this was laughed at, yet he had no doubt many had benefited by the idea. He might also mention a remedy which a relative of his who had a good deal to do with horsebreaking found effective when he had to deal with horses which persist in pulling back when tied up. This was to tie the animal up to a good sized log that it could just move when it pulls back; the horse quickly finds out that it can keep pulling until it is tired out, and be none the better off, and the habit will soon be broken. Probably there had appeared many hints in the Journal that had proved helpful to them; if so they should let the other members know. Let each one do his best to help his fellows and not remain satisfied to keep on receiving without giving something in exchange. Having connected themselves with the Agricultural Bureau, let them not grudge a little thought and attention to the improvement of their fellow-cultivators. Let them be men enough to study the welfare of the district and state. It should be the object of every member to make his branch an active institution for the good of the state; it would not prove very difficult to give their own practical experience in whatever line of industry their work lay. Take sufficient interest in the meetings to be regular and punctual in attendance, and try to induce others to attend.

Yankalilla, June 5.

Present—Messrs. Kelly (chair), Crawford, Heggaton, Dennis, Leverington, Dr. Meikle, and MacMillan (Hon. Sec.).

Wattle Growing.—Mr E. C. Kelly read the following paper on this subject:—"I have been led to introduce this subject by an inspection of wattle growing at Glenburn, which is a revelation of the possibilities of stringybark country in the way of wattle growing. The plan adopted is to grub the grasstrees in the winter, ringbark about half the timber, leaving the other half a couple of years before ringing to protect the young plants from frost. Burning before grubbing is not recommended, as the grasstrees are more difficult to kill, and altogether a heavy fire after the trees are rung makes a better job. Burn about March, and immediately after the first rains prepare the seed by placing it in boiling water and allowing it to remain for a day or two. Sow broadcast about 3 lb. to the acre. The plan practised is to have a boy to set up the sticks, and three or four men to sow the seed. The first man takes the direction, so far as possible through the standing timber, by the sticks. The others follow, judging their distance, each man sowing about four yards. Sowing the seed evenly is rather difficult, but the ashes being distributed by the winter rains assist in scattering and covering it.' Mr. G. Bennett planted about 40 acres of inferior stringybark country in this way some years ago. The paddock is now stripped out, and has produced on an average 2 tons per acre in a period of 12 years. As the price obtained averaged £7 per ton, this works out at about 16/ per acre per year, after allowing for cost of stripping and carting. Mr. Bennett now has 300 acres of similar country under wattles, in various stages of growth, from two to eight years old, one stripping having been taken off the older plantation. The trees are in splendid condition, showing a remarkably fine growth. He estimates the cost of grubbing and ringbarking at 10/ per acre, and keeping down the stringybark seedlings while the wattles are young at another 5/ per acre. Gravelly ridges do not give such good results as the slopes where bigger timber grows. I would not advocate the destruction of good splitting timber for the purpose of growing wattles. There is a very large area of stringybark country in the southern and south-eastern districts almost valueless for grazing, but which could be profitably used for wattlegrowing. The destruction of wattles by fire is, of course, the great danger. This can only be provided against by judicious burning around the plantation about every three years. Besides stringybark country there is a large area of poor land in the district which could be profitably reserved for wattles. It is advisable when a crop of wattles has been stripped out to plough or loosen the land before another crop is allowed to grow. In burning country that cannot be cultivated after the crop has been removed it is well to do so after summer rains, as the wattle seeds germinate much better by the moist heat caused by the dampness of the soil. Almost any land in the south that will produce fair-sized timber will grow wattles, but in poor soil it is not well to have them too thick. Rabbits and sheep will effectually prevent young wattles growing, and must be kept off. When wattles are six or seven years old they should be thinned out about every two years until the plantation is exhausted. As much as 4 tons of bark per acre has been obtained in this district in 12 years. I am satisfied that at £5 per ton, allowing £2 per ton for stripping and carting, bark can be produced in 12 years to the value of from £6 to £12 per acre, according to the suitability of the land for growing wattles. Taking the last three years the output of bark for this district has been worth to the producers about £6,500 a year. Now, as to the prospects of the bark market I am unable to say anything very definite. Production in this district is on the decrease, and unless action is taken to protect the young plants from rabbits will still further decrease. Over the whole of South Australia the production of bark is on the increase, an additional quantity being grown in the south-east. Some 20 years ago our then Conservator of Forests sent a quantity of wattle seed to Natal. It appears to have been made good use of, as I see from figures supplied by the Commercial Agent of New South Wales the value of bark exported has increased from £12,569 in 1894 to £69,850 in 1891, the quantity in the latter year being 13,771 tons. He states the area under wattles is rapidly being increased, and I am informed that the crop is a very profitable one. As land and labour are cheap we may expect a strong competitor in Natal for the London market. However, I think we may plant with a fair expectation of the price of bark not going much below £5 per ton."

Bowhill, June 13.

Present—Messrs. Norman (chair), Johnson, Burton, Tyler, Weyland, Waters, Whitfield (Hon. Sec.), and one visitor.

Poultry.—Mr. W. Towill stated that he found poultry rearing very profitable. Notwithstanding the high price this season for wheat, he got more for it by feeding it to fowls. He had crossed the Minorca and Leghorn (brown and white), and found the strain splendid layers.

Stonegathering.—Mr. Johnson read a paper on this subject. He though a good stone rake could be made with spring steel teeth 3 in. wide and half an inch thick. The rake should be 6 ft. long, 3 ft. 6 in. high, and the teeth 4 in. apart. First of all stones more than a foot across should be gathered by hand and carted off, then the smaller stones could be raked into rows and removed, and utilized in the construction of fences.

Mundoora, June 5.

Present—Messrs. Harris (chair), Allen, Beck, Mildren, Button, Mitchell, Loveridge, Angley, Shearer, and Gardiner (Hon. Sec.).

Redwater in Cattle.—The Hon. Secretary stated that one of his cows had been passing blood in the water. He had given it spirits of nitre and aconite, with good results. The Chief Inspector of Stock had recommended the following treatment:—Change of food; give a gallon or two of milk, with half a dozen eggs beaten up in it; a mild purgative, say 6 to 8 oz. salts and 1 oz. gentian mixed with a bran mash, should be given; give boiled linseed tea and easily digested food. Strong purgatives should be avoided; but if she will take it, give a pint of linseed oil in the soft food. Warm ale may be given as a stimulant.

State Farming.—Paper read by Mr. Campbell at Mount Gambier Conference on State management of farms was discussed, but members did not approve of the idea, though the benefits of co-operation were recognised.

Tree Planting.—The Hon. Secretary was instructed to apply to the Forest Department for 1,336 trees, members having decided to take advantage of the favourable season for tree-planting.

Eudunda, June 9.

Present—Messrs. Gosling (chair), Paech, Pfitzner, Martin, Sieber, Weil, von Bertouch, Walter, Krummel, and Marshall (Hon. Sec.).

Hay from Manured Land.—Members desired to correct statement in report of previous meeting that the branch was of opinion that hay from manured land was not so nutritious as that from unmanured land. Two members only were of that opinion.

Quorn, June 6.

Present—Messrs. Thompson (chair), Rowe, Patten, Finlay, Toll, Walker, Smith, Venning, and Noll (Hon. Sec.).

Annual Report.—The Hon. Secretary's report showed eight meetings held, average attendance over eight members, three papers read, and a number of practical subjects discussed. The membership roll had been increased, and considering the disastrous season experienced their progress had been satisfactory. The Chairman and Hon. Secretary were re-elected for ensuing year. Some discussion took place on quantity of seed to sow per acre.

Pine Forest, June 2.

Present—Members and friends met at residence of Mr. R. Barr, jun.

Motor v. Horsepower.—Careful inspection was made of a five-horsepower and corncrushing plants were being driven by the engine, and surprise was expressed at the power developed. Messrs. Geo. Wills & Co. wrote re the Ivel agricultural motor. Members were of opinion that the day was not far distant when motors would to a large extent take the place of horsepower on the farm. They agreed to work together to afford facilities for the trial of the new motors, preferably through the Bureau Field Trial Society, if any were introduced.

Fallowing.—The Chairman called attention to the improved appearance of the crops on fallow land that had been cultivated before drilling. He intended in future to cultivate the land ahead of the drill, even if it were quite clean. Mr. Inkster stated that owing to dry weather his fallowing operations last year extended over a long period, and up to the present the best growth was on the latest fallowed land. The Hon. Secretary's experience was favourable to late fallowing, both as regards liability to drift and crop returns.

Selling the Farmers' Wool.—The Hon. Secretary read a paper on "Our next wool clip" to the following effect:—"Sheepowners in this district annually receive visits from representatives of the Adelaide woolbrokers soliciting the sale of their wool. This year three agents had already called on him, and when told that he sent his wool to the South Australian Farmers' Co-operative Union, of which he was a member, it was the invariable practice for these agents to sneer at the Union, and suggest that it was a mistake for farmers to send their wool to the Union, as they did not get such good prices as if sold through the regular woolbrokers. If any question is raised as to reason why this should be so, the reply is, 'There is less competition—only seven or eight buyers attend at the Farmers' Union sales, whereas 40 to 50 are brought together when the associated brokers sell.' He considered these statements far from complimentary to the woolbuyers, and absolutely incorrect. The Farmers' Union sales were open to the general buyers and to the public, and it was certainly too much to suppose that bargains that, according to these agents' representations, would amount to hundreds of pounds additional profit, would be missed by the buyers year after year. He gave the woolbuyers credit for more sense and business ability to suppose such a thing was possible. He was sorry to say, however, that many of the shareholders in the Farmers' Union allowed themselves to be hoodwinked by these men, and each success in this direction was of course so much more towards paying their salaries and expenses. If the associated brokers would do away with these agents and reduce their charges proportionately they would render themselves more worthy of the support of the farmers. He could see no reason why the woolgrowers should be taxed fo· the support of these travelling agents, whom they did not as a rule wish to see. They would prefer the brokers to save this expense, and reduce their commission charges by even one-half per cent. Not a single pound more of wool is sold as a result of all the expense attached to these men being sent all over the State, but the woolbrokers' commissions had to be made large enough to cover the outlay. In other words, the growers pay it all. He thought, however, the remedy lay with themselves; let them refuse their clip to any agent that calls; or, better still, make an agent's call their reason for refusing, on the ground of economy, to entrust their wool to the firm he represents. There was no necessity for these agents; the wool firms were all known throughout the country. They advertise freely, and the reports of their sales are published in the papers; and from these reports the farmers can easily judge whether any one firm secures better prices than another. Shareholders should support the Farmers' Union. If it were true that buyers refused to attend their sales it could only be due to so many shareholders being bluffed into neglecting their own interests—another proof of the lack of cohesion among farmers. Personally he did not believe that the wool sold by the Farmers' Union did not fetch market value, while there was a considerable difference in the charges. One large sheepowner he knew of paid £17 more in commissions to one of the associated brokers than he would have done if he had sent his clip to the Union. He was not likely to repeat this mistake, and his neighbours were taking account of the state of affairs.

Mount Remarkable, June 4.

Present—Messrs. Jorgensen (chair), Foote, Challenger, Yates, McIntosh, Morrell, Casley, and O'Connell (Hon. Sec.).

Cream Separators.—In reply to question re the advantage of the separator for small dairies, several members were in favour of the separators as compared with the old system; cleanliness, improvement in quantity and quality of butter, saving of time and room, were particularly mentioned.

Ploughing.—Mr. Casley initiated a discussion on this subject. While he believed in the stumpjump plough for rough land, he would use the set plough whenever possible, as he believed it did better work. Mr. Yates agreed, but Mr. Challenger expressed a preference for the stumpjump plough on all soils. He would use a coulter, well set, at all times. The Chairman said he would only use the coulter when the ground was moist.

Millicent, June 4.

Present—Messrs. Hart (chair), Crouch, Varcoe, Hutchesson, Oberlander, Warland, Campbell, Davidson, and Harris (Hon. Sec.).

Rugging Cows.—Several members stated that they were protecting their cows with rugs, but up to the present they had not noticed any appreciable difference in the milk yields.

Dairying.—Mr. Campbell read some extracts showing the marvellous progress of the dairying and allied industries in Denmark. There were a number of country agricultural schools, besides a well-equipped Veterinary and Agricultural College in Copenhagen, which were assisted by the State.

Salting Cattle.—The Hon. Secretary read extract from "Hoard's Dairyman," in which the writer stated that he salted his cattle entirely on their backs for several reasons. The cattle take the salt as they want it, and not only lick themselves but each other, and get more friendly. Besides, it will keep off lice and other vermin. Salt and sulphur sprinkled on pigs will keep away lice and prevent mange.

Speying Cows.—Mr. Crouch read a paper on this subject.

Strathalbyn, June 15.

Present—Messrs. M. Rankine (chair), W. M. Rankine, Sisson, Mules, Reed, Cockburn, Michelmore, and Cheriton (Hon. Sec.).

Agricultural Motors.—Discussion on the use of motor power on the farm took place. Members were unanimous that a three-horsepower motor would be too small to be of much use on South Australian farms. [The Ivel agricultural motor is an eight-horsepower motor.—Ed.]

Annual Report.—The Hon. Secretary reported ten meetings held, with an average attendance of eight members. Three papers were read by members, and these, with several of the papers read at the Southern Conference, were well discussed. The annual Conference held in April was fairly successful; but he thought these annual gatherings should be attended by more of the officers of the Department of Agriculture. He believed there was a great future before the Agricultural Bureau, and hoped that the members would endeavour to induce their neighbours to attend the meetings.

New Oats.—Mr. W. M. Rankine read extract referring to the prolific nature of the Newmarket oats. Mr. Cockburn had grown some of this variety, and spoke highly of its strong growth and value as fodder.

Horsebreeding.—Mr. Mules read a paper on how to breed a hack.

Baroota Whim, June 13.

Present—Messrs. Simper (chair), Brideson, McDougall, Spencer, and Hoskin (Hon. Sec.).

Dairying.—Mr. McDougall initiated a discussion on this subject, and strongly recommended the testing of the cows with a view to weeding out the least profitable animals. He suggested that the branch should secure a Babcock milk-tester for the use of members. It was agreed that cows should be tested regularly, and all those not producing enough butter to be profitable should be fattened and disposed of.

Season.—A number of horses have died from sand, due to shortness of the herbage. Crops are looking well, but some farmers were not able to finish seeding owing to the absence of rain. Only light showers have fallen during the past two months. Some cattle have died from eating poisonous plants.

Morgan, June 6.

Present—Messrs. Windebank (chair), R. and H. Wohling, Hahn, Bruhn, Pope, Plummer (Hon. Sec.), and one visitor.

Wild Dogs.—Mr. H. Wohling would like to know which was the best way to catch wild dogs. The dogs were very troublesome in his locality, but he had not been able to catch any in traps.

Best Three Wheats for District.—Mr. R. Wohling read a paper on this subject. He favoured Purple Straw, Steinwedel, and White King (?). It was a mistake to sow only early wheats, as the later varieties often give the best returns. He had no doubt they could considerably improve the yields by selecting their seed wheat. He had often noticed that after a few years newer varieties show a marked falling-off in the yield. For instance, Steinwedel did not do so well now as when first introduced. He believed that by the selection of the best heads of any particular variety for the purpose of raising seed they could prevent this deterioration. Mr. Bruhn considered Steinwedel too unreliable, owing to its liability to shake out, and also it was of little value for hay. Mr. Hahn said that, notwithstanding the losses owing to the grain shaking out, he found he reaped as much from Steinwedel as from other varieties he had grown. Several members referred to the difficulty experienced in purchasing seed wheat true to name and free from foreign seeds. On a vote being taken, it was decided that Purple Straw, Steinwedel, and Bluey (Dart's Imperial), were the three best wheats to grow in this district.

Inkerman, June 9.

Present—Messrs. Smart (chair), Lomman, Board, C. H. and C. E. Daniel (Hon. Sec.). and five visitors.

Rugging Cows.—A short discussion on this subject took place. Several members thought in this district it would be better to put the money required into feed for the cattle, but the Hon. Secretary thought it would pay even here to rug the cows.

Improvement in Farming Methods.—Mr. Board initiated a discussion on the better utilization of their opportunities. There was much truth in the old saying that it was a mistake to carry all their eggs in one basket, and unfortunately in this locality their choice of baskets was extremely limited. Most of the district was light scrub country, which if left out of cultivation for too long gets too scrubby for much feed to grow. They were therefore compelled to crop this land occasionally to prevent the bushes overrunning it. In the past the wheat they had grown had all been disposed of to the wheatbuyer; this he thought a great mistake. By feeding some of the wheat to fowls they could secure twice as much per bag for it as they got from the wheatbuyer They must, of course, be properly cared for; if neglected, allowed to roost anywhere, and in too large mobs, they will prove unprofitable. There was room for considerable expansion in their production of eggs and poultry. Then some of the wheat could be profitably fed to pigs; some farmers seem to expect them to live largely upon straw and slops. Two small paddocks should be fenced off alongside the sties and sown with barley for the pigs. It would also pay to devote more attention to horsebreeding, as they do well and keep very healthy in this locality; they differ from cattle in this respect, as the latter do not thrive so well during the long, dry summer. Sheep might also be kept with profit to a greater extent than at present. In reply to question. Mr. Board stated that several years ago he gave 10/6 for half a dozen Silver Wyandotte eggs and had splendid results for his outlay; the cross with the common fowls did well. He favoured raising chicks the whole year round. Mr. Lomman had been very successful with the Langshan crossed with the common fowls; it was not advisable to keep the rooster too long In respect to dairying, he agreed that dairying was not worth the trouble in this district. The Hon. Secretary stated that since using bonemeal, salt, and sulphate of iron his cattle had been in good health, and he felt confident that the complaint of impaction or paralysis would be prevented if this were given regularly. He thought dairying would pay even here.

Annual Report.—The Hon. Secretary's report showed ten meetings held, with an average attendance of 6.5 members. Messrs. C. H. Daniel, Smart, and C. E. Daniel were elected Chairman, Vice-Chairman, and Hon. Secretary respectively.

Kapunda, June 6.

Present—Messrs. Shannon (chair), Kerin, Pascoe, Banyer, Flavel, O'Sullivan, and Harris (Hon. Sec.).

The Drought and Its Lessons.—The Chairman read a paper on this subject. With the break up of the drought the time was opportune for those who had suffered from its effects to seriously think how best, in the future, to mitigate as far as possible the disastrous consequences usually attending these long spells of dry weather. There was an old saying that "adversity teaches," and the experiences of the past few years have taught many lessons that should not readily be forgotten by those interested. First of all, in good seasons care must be taken not to overstock the land; and, secondly, let all the spare feed be conserved to make provision for seasons of scarcity. It was well known that in the past landowners who had passed through bad years had during the first good year following made some attempt to store up reserve supplies of feed, but when the seasons continued good they relaxed their efforts, and even neglected to take care of what they had already stored, with the result that when the dry seasons came along food and water got scarcer and scarcer, with the usual result, viz., starving stock, hardship, misery, and loss. It was the absolute duty of the farmer in dry areas to cut in good seasons a fair proportion of the crops with the binder and stack the straw for future contingencies. These stacks should be properly covered with thatch, and the contents will keep good for many years; in fact, apparently it improved with age, as stock seemed fonder of old, well kept straw than new straw. It was also possible for many pastoralists to save large quantities of feed in good seasons. The conservation of water, or providing a permanent supply from underground, was of even greater importance than the conservation of feed. While stock will live on short allowance of food in dry times, they will not do well for a single day without water. Over a great part of Australia the only sure way of providing sufficient water in time of drought was by means of artesian bores. He did not think that the artesian supplies had been availed of to anything like the extent they should be, as given water green feed could be grown even in the driest years. It also seemed a pity that the waters of the Murray had not been more largely utilized for irrigation purposes in the past; the proposal to lock the river in sections, if adopted, would enable a large number of people to do well along the course of the stream. Although the recent drought is generally admitted to have been the worst experienced since the white man settled in Australia, they could not shut their eyes to the fact that they were living in a land which must always be liable to long spells of dry weather; but if men would only take to heart the lessons taught by these famines there is no question but that they would to a very large extent avoid the disastrous losses which have occurred in the past. Mr. O'Sullivan agreed that a lot could be done in the conservation of straw; it might be utilized to build rough shelters for stock. He had seen stock leave green grass for a feed of straw. Mr. Banyer agreed with Mr. Shannon as to the possibilities of the swamps along the Murray, and referred to the enormous crops grown at Markaranka and elsewhere lower down the river. Irrigation was necessary to utilize these rich lands to the best advantage. In reply to a vote of thanks, Mr Shannon stated that he had tried the experiment of cutting the stubble with the binder following immediately after the stripper, and stacked between 60 tons and 70 tons of straw. The straw was utilized to build simple shelters, which were greatly appreciated by his stock. He had chaffed this straw with self-sown hay—two of straw to one of hay—and although his horses refused cocky chaff by itself, they ate it mixed with this straw chaff, and kept in good condition.

Wilson, June 13.

Present—Messrs. W. H. Neal (chair), Barnes, Crossmen, Nadebaum, W. H Neal, jun., Ward, and Smith (Hon. Sec.).

Rugging Cows.—Members consider the system of rugging cows only of value with cows that are yarded regularly.

Agricultural Motors.—Members thought that the present horsepower of the agricultural motors would need to be increased if they are to be used largely.

Seed Wheat.—Dr. Cobb's report on the grading of seed wheat was discussed. Some of the members agreed with Dr. Cobb, whilst others were of opinion that small wheat will yield as well as plump seed. Two of the members agreed to sow 1 lb. of each class of seed side by side, and report results.

Morchard, June 12.

Present—Messrs. Toop (chair), Longbottom, Kummnick, Kupke, Kirkland, O'Loughlin, Kitto, and Shell.

Inaugural Meeting.—Various matters connected with the formation of the branch were dealt with. Messrs. J. Scriven, C. Longbottom, and A. Kummnick were elected Chairman, Vice-Chairman, and Hon. Secretary respectively. A programme for the next three months was arranged.

Wilmington, June 9.

Present—Messrs. Slee (chair), McLeod, Schuppan, Hannagan, A. and M. Bischof, Bauer, Broadbent, Lauterbach, Noll, Sullivan, Zimmermann, Payne (Hon. Sec.), and a number of visitors, including Professor Towar.

Soil Fertility.—After formal business was disposed of, Professor Towar gave a very interesting address on various matters, dealing with the cultivation of the soil. The value of fallowing for the conservation of soil moisture and its action on the food constituents was strongly emphasized. The various conditions and constituents that go to make soil fertile were discussed, and an interesting account given of the various changes brought about by the action of the sun, air, and tillage operations. Numerous questions were answered. and a hearty vote of thanks accorded to the professor for his lecture, and the hope was generally expressed that, in view of the good done by such visits, the department would favourably consider requests from the branches for visits by the expert officers attached thereto.

Reeves Plains, June 5.

Present—Messrs. George (chair), Corden, Worfell, W. and H. Day, and McCord (Hon. Sec.).

Fallowing.—This subject was discussed at length. It was unanimously agreed that early fallowing gave best results in the long run, though several members had good crops on late fallow. Members were convinced that the more the land affected by poppies was worked the more the poppies came up. This is quite the worst weed in this locality.

Pickling Wheat.—An conversational discussion on this subject took place. Some members had heard that Gluyas wheat was more liable to bunt than most wheats, and asked if this was so. Members thought it was possible that some wheats would be more susceptible than others. It was agreed that pickling with bluestone always injured the seed to a certain extent. Several members never pickle seed when sowing for hay crop.

Scales Bay, May 30.

Present—Messrs. J. J. Roberts (chair), W. J. Roberts, A. and G. Newbold, D. P. Thomas (Hon. Sec.), and seven visitors.

Fertilisers on the West Coast.—The statement in June issue of Journal of Agriculture that the results of the experiments carried out last year with fertilisers by the Chairman were of no value was considered misleading, as the test plots demonstrated which kinds of fertilisers did best under local conditions, and also that the unmanured land gave much poorer return than the manured land—2½ bushels per acre, as compared with 10 bushels per acre. The Chairman stated that he selected an average piece of land of even quality for the test plots, and put the seed in about the middle of the tilling season. The plots were in a paddock of 200 acres, all of which, with the exception of the unmanured test plots, was manured, and the yield averaged 11 bushels.

Minlaton, May 30.

Present—Messrs. Brown (chair), J. and H. Martin, Mayor, Anderson, Vanstone, Newbold, Teichelmann, A. and J. McKenzie (Hon. Sec.).

Pickling Wheat.—Discussion on this subject took place. Most of the members have their own special methods of pickling, bluestone being the agent employed, and all of them are satisfied with the results.

Conference of Branches.—Subject to the approval of the Department of Agriculture, it was decided to endeavour to arrange for a Conference of Branches at Minlaton about September next.

Hawker, June 10.

Present—Messrs. Borgas (chair), Bowden, Schuppan, Wardle, Hirsch, Dr. Shanahan, and Smith (Hon. Sec.).

Fallowing.—Mr. Wardle read a paper on this subject. This was an important operation, and while they often hear farmers say only fallowed land should be sown, others tell them that fallowing does not pay. Where the soil and rainfall vary to such an extent as in this State it was out of the question to expect that the same treatment will in all cases give the same results. His remarks would apply to the upper north generally. First, he would advise harrowing the stubble land early to cover the weed seeds, and get them to start with the first rains. Then as soon as possible get the plough into the land, as the earlier it is broken up the more rain will penetrate. The more water they can get into the land in winter the better for the coming crop; the land will set down and require less working in dry weather to secure a firm seedbed. As little rain fell after August any fallowing done then should be shallower, and the furrows packed up close, to avoid the necessity for so much harrowing at seedtime. His experience was that the more the land is worked when dry the harder it will set when wet. Land ploughed deep late in the year, unless it gets a good, soaking rain on it, will remain too hollow underneath, with the result that the crop will go off when the dry weather sets in; this is the class of fallowing that does not pay. If it is found that the weeds are getting too forward to permit of the land being ploughed before the seeds ripen, it would be better to scarify the land, as the weeds exposed to the sun soon dry up. Land scarified in this way, and the seed sown next year with a drill, will yield better than will late rough ploughing.

Treeplanting.—Mr. Hirsch urged members to give some attention to treeplanting, in view of the rains that had fallen; owing to the drought they had not been able to do anything in this direction of late years. The gumtrees at his place were a great improvement. He also thought they should take up the cultivation of saltbush. The Hon. Secretary was asked to obtain several hundred young gumtrees for members.

Mules for Farm Work.—The Chairman said that, as the number of working horses in the district had been so seriously depleted, it might be advisable for them to give some attention to mule-breeding, as they were reported to be hardier than horses, and equally useful on the farm. Perhaps, if they breed the proper class of mules, they would find them better than horses for this locality. Several members supported the Chairman's suggestion, and it was decided that the Hon. Secretary enquire as to cost of a good jack donkey.

Davenport, May 28.

Present—Messrs. Trembath (chair), Brown, Hodshon, Lecky, Roberts, McDowell, Holdsworth, and Pybus (Hon. Sec.).

Ringbarking Currant Vines.—An enquiry on this subject was referred to Professor Perkins for reply. [Experience alone will tell whether the ringbarking of currant vines will prove of value under special conditions. The operation should be performed when the flowers begin to open.—Ed.]

Early Vegetables.—Mr. Hodshon staged a splendid sample of early vegetables —McLean's Little Gem peas (splendidly grown); white Spanish onions; Snowball turnips, of excellent quality and large size; curled parsley, lettuce, James's Intermediate carrots, tomatoes, and, now showing the result of turning stock into the vineyard (cattle pruning), a second crop of grapes. The berries were immature, and Mr. Hodshon expressed the view that the vines would suffer. The Chairman tabled a sample of Stratagem peas. These were of good colour and healthy in appearance, but failed to fill; causes were suggested—extensive watering, over manuring, &c.

Making Work Easier for the Horse.—Mr. J. E. Lecky read the following paper:—In order that the owner of a horse should get the best possible results from his exertions, there are a few details which he should consider. First, see that the harness fits properly. If broken properly, he considered a horse far safer to handle with an open bridle, being an intelligent animal when he finds he is not ill-treated. He will be less nervous when he can see what is going on around him, and less liable to shy when driven in harness. He believed the eyesight of many horses is injured by wearing close winkers. The next and very important detail is to have a perfect-fitting collar for each horse. He had often wondered that some one has not invented a better class of collar. He had spoken to a practical maker, and he agrees with him there is room for improvement, especially in collars. For heavy work, those lined with check and stuffed with horsehair or chaff even get lumpy with sweat and dirt. Iron collars have proved a failure in this hot climate, though they are said to be extensively used in New Zealand by farmers. Collars lined with leather get chipped and uneven during hot weather, and why cannot a collar be made of solid rubber? A member of this Bureau always soaks a new collar for 12 hours, and puts it on the horse it is intended for before it is dry, and then works him, and the collar adapts itself to the shape of the shoulders. The next point is the way a horse should be attached to the load he has to draw. At dray work he is generally fastened to the shafts by traces or tugs to fixed hooks on the shafts, and sometimes you will see a low-set horse pulling from a higher level than where the pull is on the shoulders, which is a waste of energy, and liable to throw a horse on his knees. Another objection to this kind of attachment is if one wheel goes into a rut or hole a sudden jerk on one shoulder results. Add to this uneven traces caused by breakage or knots—result, sore shoulders. To remedy this all attachments should be fastened to the centre of resistance, viz., the axle. This can be done by a swingle-tree fastened to the traces with rods or chains from the centre of swing carried back to the axle on each side to the clips. Then take a line from the shoulders where the pull comes from to the axle, measure the depth where your swingle-tree is to hang, and make your loops of leather or hide, so that it will hang low enough for a straight pull from shoulder to axle. This will give the horse greater power to lift his load, and the swingle-tree will give to any unevenness of road or length of traces. With vehicles that have pole instead of shaft it is more difficult. With bent poles place the main bar underneath the pole, and the swingle-trees under that again, then when the horses were pulling they would carry the weight of the pole by the traces instead of the neck, doing away with the pole chain. It might not look so well, but the horses would benefit by the change. Where there is a straight pole the crossbar could be left long enough to carry the swingle-trees, looped up the same as on a dray, with a single rod attached and carried back to the axle. One fixed like this may be seen in the Port at work, and the owner claims that it gives the horses greater power drawing the vehicle and less strain on the pole than those in common use. In conclusion, if the plan of draught which I have outlined were adopted, there would be less strain on the vehicles, and the horses' work made easier."

Port Pirie, June 6.

Present—Messrs. Johns (chair), Hannan, Crispin, Bell, Wright, Hector, Jose, and Wilson (Hon. Sec.).

Lucerne.—Mr. E. J. Hector read a paper on this subject. Of all fodder plants introduced into Australia it is the best and largest producer during the summer months on suitable soil. The best soil for lucerne is a rich, deep alluvial, containing plenty of humus; such can be found along rivers and creeks, and in the gully flats. If the land is subject to occasional short inundations, or even to one good flooding in winter, the growth made during the summer is very luxuriant. Where it can be irrigated a good patch of lucerne will produce equal to one ton of hay per acre for every six or seven weeks during the summer. On rich alluvial flooded land at Langhorne's Creek he had fed three horses and three cows throughout the summer upon three-quarters of an acre of lucerne. He had also noticed in his travels in various parts of Europe and America that lucerne was grown in the richest soils. There were two seasons in South Australia when seed can be sown, viz., in April before frost sets in or in spring. The latter was the better, as their native grasses grow much quicker in the cold weather, and are likely to smother the lucerne. Seed is usually broadcasted, but sowing half an inch deep in rows

9 in. apart would be more satisfactory. Great care must be taken to cover the seed lightly; deep seeding was disastrous. He had sown lucerne in various places and in different quantities per acre, and would consider 5 lb. to 6 lb. per acre of good seed ample. It is a good plan to test the germinating power of the seed before sowing. This can easily be done by placing a small quantity between damp flannel or blotting paper, moistening it three times a day. In a few days the seeds will germinate if good, and the percentage can be readily determined. He had tested three samples recently; one gave 46 per cent. of germination, a second 56 per cent., and the third 78 per cent., and as far as appearances went the latter did not look any better than the second sample. Fresh colonial-grown seed, if not injured in threshing, was most satisfactory. The Chairman read extract dealing with satisfactory results from feeding lucerne with maize meal to pigs.

Broadleaf Mustard.—Mr. Jose tabled good sample of mustard grown from seed sown on March 25. Sheep and horses eat the plant, but cattle do not care much for it.

Nantawarra, June 12.

Present—Messrs. J. Nicholls (chair), R. Nicholls, Dixon, Sleep, E. J. and A. F. Herbert, Greenshields, Dall, Spencer (Hon. Sec.), and two visitors.

Annual Report.—The Hon. Secretary's report showed eight meetings held, average attendance 8.6, papers read 2, and numerous discussions. Mr. Jeffrey, the wool expert, had formed a class with fifteen members. A very profitable year's work had been completed.

Pickling Wheat.—Mr. R. Nicholls stated that he had tried pickling wheat in a trough large enough to permit of a bag of wheat being immersed in the pickle. The wheat was left in until all bubbles ceased to rise, and on examining it afterwards he was satisfied that the contents right through the bag were well pickled.

Argentine Wheat.—The Chairman tabled sample of Argentine wheat. Members thought the sample a very poor one. Several members took a few seeds to grow.

Caltowie, June 9.

Present—Messrs. Hewett (chair), Graham, Petatz, Potter, Jettner, Neate, J. G. and F. Lehmann (Hon. Sec.).

Sparrows.—Sparrows are very numerous in this district, and are responsible for a great deal of damage to crops. Mr. Lehmann thought it should be possible to get poisoned wheat cheaper than present prices. He suggested that the branch should endeavour to get other branches to unite with them in bringing before the Minister the necessity for making some provision for supplying well-prepared poisoned wheat to farmers and others at reasonable prices. Poisoning seemed the most effective way of dealing with the pest.

Wandearah, June 8.

Present—Messrs. Robertson, W. and R. Roberts, Davidson, Dick, Collins, Fuller, Munday, E. H. and E. J. Eagle (Hon. Sec.).

Motor Power.—Discussion on this subject took place, it being resolved that without more information about the new motors it was not possible to say whether they would be of value under local conditions.

Rugging Cows.—Members were favourably impressed with the arguments in favour of the rugging of cows during the cold weather. The effect of a cold, stormy night on the milk returns had been noticed, also the fact that cattle in protected places will go on feeding, while those on the open plains will lie down apparently for shelter. The necessity for some protection being afforded being admitted, the question arose as to how to give it, i.e., by erecting shelters, growing trees or hedges, or rugging.

Koolunga, June 11.

Present—Messrs. Sandow (chair), Button, Lawry, Jose, Burgess, Cooper, Palmer, Butterfield, Noack (Hon. Sec.), and two visitors.

Lucerne.—Mr. Burgess read a paper on this subject. In preparing the land first fallow it to depth of 5 in. where the land is firm, or 4 in. on sandy land, such as the Broughton Flats. After ploughing cross-harrow twice, and if at all inclined to be rough roll with heavy roller. The object is to get the surface fine and the ground solid. Before seeding, harrow with light harrows and broadcast the seed on top, then roll twice, but do not harrow. If the seed is drilled in sow as shallow as possible after rolling, then roll the land again. For broadcasting not less than 8 ℔. per acre of seed is required; with the drill 6 ℔. to 8 ℔. will be sufficient. Sow about middle of April, or from middle to end of August; in this district the April sowing was preferable. It was not a good plan to put in the seed with wheat or other grain, as the lucerne should make vigorous root growth while the ground is moist, and before the hot weather sets in. If sown with the wheat it becomes weak and spindly. Do not feed off the first season, but if it grows too rank cut it as close as possible with the ordinary mower. After the first year the lucerne can be grazed; fence the land into convenient-sized paddocks, making them sheepproof. When the lucerne is in flower put on stock enough to feed it off quickly, then shift them. It is a good plan to put on the dairy cattle for a fortnight, then remove them to the next paddock, and let sheep take their place. Never put on the sheep until the lucerne is picked down properly; let the sheep feed it down as bare as possible, then shift them to the next paddock, and so on right over the area under crop. He considered this thorough feeding down essential to success with lucerne; if the stock are removed too soon the old stems will sprout instead of new growth coming from the bottom. To allow the lucerne to seed, do not feed it down after the middle of March or beginning of April, according to season, and do not place stock on the paddock again until October. Considerable discussion ensued, and Mr. Burgess answered a number of questions.

Mount Gambier, June 13.

Present—Messrs. Mitchell (chair), Watson, Pick, Barrows, Dyke, Ruwoldt, Williams, Clarke, Wilson, and Lewis (Hon. Sec.).

Forestry.—Discussion on the growth of ironbark in the forest reserve took place, and regret was expressed that the young trees in the portion handed over to the local corporation should have been destroyed.

Bunt and Smut.—An enquiry was made as to the difference between bunt and smut in cereals, and how to prevent damage. Members thought the disease in wheat, known under the two names, was identical. Pickling with bluestone was mentioned as being generally adopted as a preventive, some pickling on the floor and others in casks. The use and value of lime as a preventive of disease was mentioned. The hot water remedy was also referred to; on the question of the possible danger of injuring the wheat with hot water, Mr. Ruwoldt stated that he poured boiling water over some wheat that he was poisoning for the benefit of sparrows, and getting wet in the bag it had sprouted.

Potatoes.—Mr. Lange forwarded bulletin on nematode worms, and letter from Professor Perkins, stating that the water blister on potatoes was caused by these worms. Some discussion on the subject took place, Mr. Williams stating that some years ago he had discovered the worms and their eggs in the affected potatoes. Black or brown spot in potatoes was also mentioned. Two of the members stated that affected patches of potatoes which had not been dug for some time after they should in the ordinary circumstances have been lifted were now found to have almost lost the brown marks characteristic of the disease. The question of cause of the trouble was referred to; lack of potash being suggested by some, while it was stated that at Glencoe it was only on the sandy soil that the potatoes suffered. The Chairman had, however, seen potatoes growing on the richest land quite black, and on clayey soil near Casterton potatoes were similarly affected. Mr. Ruwoldt promised to try the effect of a dressing of sulphate of iron for water blister.

Riverton, June 13.

Present—Messrs. Hussey (Chairman and Hon. Sec.), Gray, Gravestock. Kelly, A. J. and W. B. Davis, and Calf.

Elementary Agriculture.—Mr. Hussey read a short paper on this subject, dealing with the characteristics of various soils, &c.

Feeding off Crops.—Several farmers have found it necessary to run sheep on their crops this year. Some members questioned whether it was advisable to feed off the crops except on fallowed land. [Why?—Ed.]

Rugging Cows.—A member asked whether rugging cows during cold weather would not have a tendency to make them delicate. [Rugging the cows during cold nights or bleak weather and removing the rugs with the rise in temperature is hardly likely to make the animals less hardy. Unfortunately, however, some cowkeepers, who have adopted the practice, leave the rugs on all day and night, even when the sun is shining and the weather mild. This is certainly likely to render the animals more susceptible to injury by cold winds, &c.—Ed.]

Whyte-Yarcowie, June 20.

Present—Messrs. Hack (chair), Hunt, Fane, Dowd, McLeod, Mitchell, Mudge, Kornetzky, Boerke (Hon. Sec.), and one visitor.

Farm Implements.—Members did not think the complete harvesters would prove very serviceable in hilly country owing to their heavy draught, nor would they be of much use in light crops. Two of the members reported favourably of Dunn's patent in connection with winnowing machines; the only objection noticed was that it left too many pieces of straw in the wheat. This could easily be overcome, however, by inserting another sieve. Discussion was continued on scarifiers v. cultivators. Mr. Kornetzky thought the scarifier, being heavier, would enter the hard soil better, and would also do better work in sticky soil. The cultivator also left small ridges behind it, and in hilly country the water would collect and run in the depressions between, causing the land to wash. In other respects the cultivator was better than the scarifier.

Farm Fences.—Mr. Mitchell described a very cheap and serviceable fence: Sandal-wood posts, 4 in. to 6 in. in diameter, placed a chain apart, with five wooden droppers between, a barbwire on top and four wires below. Waite's special steel wire should be used; for splicing use No. 8. A fence of this character is springy, but will last well.

The Boy on the Farm.—Mr. Dowd read a paper on "What should our boys learn and do on the farm?" When a boy has attained the age of five or six years he may start at school, as he is capable of acquiring knowledge of a rudimentary character. It is, however, important that this knowledge be imparted in a cheerful manner. When he is a little older and can be made to understand why he is sent to school he will make more rapid progress, but cramming in any subject should be avoided. When at home his mind should be directed from his mental work at school, and he should be given some regular manual work of a light character. Never do for the child what he can do for himself, otherwise he is encouraged to idle or depend upon others instead of on himself. Little domestic duties should be taught him. When he is old enough teach him to milk, to catch and saddle his horse, to go messages, make a fire, and, in fact, be generally useful to his parents so far as he is able. Reward him unexpectedly when he has voluntarily done some work to encourage him to greater efforts. As he becomes stronger teach him to drive, instruct him how to plough, &c., show him how a certain horse should be kept in the furrow to enable him to plough evenly. He will, with intelligent instruction, soon become as proficient as a man in ordinary farm work, which does not need the exercise of strength. Where possible every lad should be taught to swim, and be made thoroughly acquainted with the use and dangers of firearms. As all boys are fond of horses, provide him with a pony or saddle horse on the understanding that he must look after it himself, feed and groom it regularly, and treat it kindly. As there are always some young horses to be broken in on a large farm, encourage him to render assistance, and explain operations to him. It is far better for the farmer to be able to break in his own horses, as he will know the temper of each better, and the horse will also know his master. Teach the boy as much as possible about farm stock, their characteristics, diseases, &c. When he has sufficient knowledge, consult him on various matters to give him confidence in and respect for himself. As he grows older make him acquainted with the construction and uses of the more complicated farm implements. Caution him of the necessity for keeping all bolts tight, and all bearings well oiled. The erection of fences building of stacks, and, where stone is plentiful, rough stone walls, all come within the scope of a farmer's work, and the boy should be taught these operations as opportunity affords. Any lad who has been taught in the manner described would be able to earn his own living at any time. He considered it the duty of parents to provide their boys with a fair supply of pocket money when they are old enough to make reasonable use of it. If they are debarred for want of a little money from joining other young people in going to places of amusement or taking part in sports, they will possibly end by entertaining rebellious feelings against their parents, besides which, there will be a danger of their being tempted to convert into money something that does not belong to them. Where possible musical instruments should be provided for them, and facilities given them for innocent amusements at home.

Burra, June 12.

Present—Messrs. McDonald (chair), Flower, Scott, Duldig, Heinrich, Goodridge and Harvey (Hon. Sec.).

Rugging Cows.—Mr. Flower had tried this practice for a month and was satisfied it would pay. Mr. Harvey was also certain from his own experience that cowkeepers would soon realize that it was to their own interests to rug their cows during the winter months, especially where they are kept in small yards at night.

Experimental Cultivation.—In reply to enquiry, the Hon. W. B. Rounsevell wrote giving particulars of the work of experimental cultivation as carried out in the United States and Canada under the supervision of the respective Departments of Agriculture. In Canada there were as many as 30,000 experimental plots carried on by farmers and others in various parts of the country. The cultivators were invited to suggest questions worth testing, and the department then arranged series of trials, and supplied seeds and manures for the purpose free of charge. Care has to be taken by the experimenters to carry out the tests as arranged, and to record and report results on printed forms supplied to them. Most beneficial results had been secured from these co-operative experiments, both as regards the financial and social conditions of the settlers. In other parts of the world similar assistance was given to agriculturists, very great stress being laid on the value of this experimental work. Discussion followed; members thought the greatest drawback to the adoption of any such scheme was the cost to the State of supplying seeds and manures. It was the general opinion that the farmers should undertake such experiments for themselves, and not ask the Government to provide the funds.

Grading Seed Wheat.—Mr. McDonald was strongly of opinion that it would pay to grade their seed wheat. This year he and his brother had thoroughly winnowed some seed, and as a result got a splendid sample weighing about 10 lb. per bushel more than the same wheat as ordinarily cleaned.

* * *

Port Elliot, June 20.

Present—Messrs. McLeod (chair), Pannel, Gosden, Welch, Wilkinson, Hutchison, Brown, Basham, Nosworthy, W. E. and W. W. Hargreaves (Hon. Sec.).

Rugging Cows.—Members were of opinion that it was of great advantage to protect the cows in this way during cold weather. Some members advocated keeping them in the stable at night during cold weather, and supplying them with greenstuff.

Water Conservation.—The Chairman read from report of Burra Branch paper by Mr. W. G. Hawkes on "Water conservation and irrigation." The paper met with the approval of the majority of the members.

Dairying.—Mr. Welch advocated growing early feed for cattle, Cape oats or Cape barley for preference. He would have them come in about March or April when milk was fetching highest prices. Mr. Gosden applied about 4 cwt. super. per acre to a young green crop as a topdressing, and killed the feed. Members considered the dressing too heavy. Mr. Williamson read extract from The Australasian on the improvement of dairy herds. The article pointed out the necessity for testing all the cows, and weeding out those returning the least profit. A good sire of a proved milking strain should be used in the herd, and the heifers from the best cows kept to replace the cows that are culled out. Care must also be taken not to rear heifers from cows suffering from any defects or disease. Good care of the herd was also essential. The better they are treated the better will be the returns.

Saddleworth, June 20.

Present—Messrs. Benger (chair), Adams, Daley, Eckermann, Leeder, Plant, and Coleman (Hon. Sec.).

Motor Power.—Members are considerably interested in the Ivel agricultural motor, and would particularly like to know how the difficulties in the way of effecting repairs, and the possible danger of fire in the harvest field would be overcome.

Bleached Wheat for Flour.—Discussion took place on report appearing elsewhere in this issue on tests of bleached wheat for flourmaking purposes.

Agricultural Classes.—It was resolved that this branch is heartily in sympathy with the proposal of Mr. J. Miller for classes on special agricultural subjects being arranged in suitable localities. [As will be seen from report of meeting of Council of Agriculture in this issue, Professor Towar reports that the scheme is impracticable, but suggests the establishment of a series of short courses at the college for the benefit of those who cannot enter as students for the ordinary courses.—Ed.]

Orroroo, June 19.

Present—Messrs. Scriven (chair), Moody, Copley, Lillecrapp, Brown, Roberts, and Tapscott (Hon. Sec.).

Annual Report.—Seven meetings have been held, and the average attendance fairly well maintained. The severe season experienced has made it difficult to carry on the work satisfactorily. Messrs. J. Moody, E. Copley, and T. H. P. Tapscott were elected Chairman, Vice-Chairman, and Hon. Secretary respectively. Regret was expressed at resignation of the late Chairman, who has become a member of the Morchard Branch.

Gardening.—Mr. Scriven tabled large piemelon and branches from apricot trees. Discussion ensued on the question of gardening. It was agreed that a garden makes the homestead more attractive, and that the fruit and vegetables grown are much preferred to those purchased from the hawkers. Difficulties are experienced in keeping a garden going in these dry areas. A number of gardens have been planted in years gone by, but very few of any value are now to be seen in this locality.

Mannum, June 5.

Present—Messrs Preiss (chair), Walker, Baseby, Ramm, and Wilson (Hon. Sec.).

Motor Power.—Members were much interested in the accounts of the Ivel agricultural motor, and thought if it would do the work claimed it would be a good thing for farmers. Further information on the subject is desired.

Argentine Wheat.—Mr. Walker tabled sample of recent importation of Argentine wheat, and some discussion ensued. Members have decided to sow seed for the purpose of comparing the grain with South Australian wheats grown under similar conditions.

DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

With a view of publishing in the "Journal" the dates of meetings of the branches of the Agricultural Bureau, Hon. Secretaries are requested to forward dates of their next meeting in time for publication.

Branch.	Date of Meeting.		Branch.	Date of Meeting.	
	1903.	1908.		1903.	1903.
Arthurton	July 9	Aug. —	Mount Compass	July 11	Aug. —
Balaklava	11	8	Mount Remarkable	10	6
Booleroo Centre	7	4	Mundoora	—	—
Bowhill	11	8	Nantawarra	8	5
Brinkworth	3	7	Naracoorte	11	8
Burra	10	14	Narridy	4	—
Bute	7	4	Norton's Summit	10	7
Cherry Gardens	14	11	Onetree Hill	10	7
Clare	10	7	Orroroo	17	4
Clarendon	15	—	Paskeville	4	—
Colton	4	1	Penola	11	8
Crystal Brook	4	—	Pine Forest	7	4
Eudunda	13	10	Port Elliot	18	15
Finniss	6	3	Port Lincoln	17	21
Forest Range	9	6	Port Pirie	—	—
Gawler River	10	7	Quorn	11	—
Gladstone	4	1	Red Hill	7	—
Hartley	10	—	Reeves Plains	10	7
Inkerman	7	4	Rhine Villa	10	7
Johnsburg	4	8	Riverton	4	1
Kanmantoo	10	7	Saddleworth	18	15
Kapunda	4	1	Stockport	6	3
Kingston	4	1	Strathalbyn	20	17
Koolunga	10	6	Wandearah	6	3
Lyndoch	9	—	Watervale	6	3 & 31
Maitland	4	1	Wepowie	8	—
Mallala	6	3	Whyte Yarcowie	18	15
Mannum	3	—	Willunga	4	1
Minlaton	25	29	Wilmington	8	5
Morgan	4	1	Yankalilla	3	—

VENTILATION OF FACTORIES AND WORKROOMS.

Contributed by the Chief Inspector of Factories.

(Continued from page 716.)

IV.—Dust and Fumes from Manufacturing Processes.

As we hope to refer to dust and fumes in a further report, only a few remarks on the subject are needed here. Wherever possible dust, fumes, and evil-smelling vapours should be dealt with at their point of origin, and never allowed to mix with the general atmosphere of a room. Where this is not done the only remedy is to increase the general ventilation to such an extent as to sufficiently dilute the impurities. The result of such a course is, however, apt to be very unsatisfactory, as sufficient ventilation often cannot be obtained without exposing the workers to an intolerable amount of cold and draught, or incurring great expense in warming the incoming air. Moreover, the increased ventilation often carries through a room a great deal of dust which would otherwise subside in the immediate neighbourhood of the machine which produces it.

V.—Accidental Impurities

The air of a workroom may be contaminated from sources outside the room, as from leaky drains, or badly kept urinals or waterclosets. The smells thus arising may, like other unpleasant smells, affect the general health of those exposed to them, although it is not at all probable that specific diseases are communicated by so-called "sewer gas." A badly designed, badly lit, or badly kept urinal or watercloset may easily be the means of communicating infective diseases, particularly as it is now known that the excreta of persons who have recovered from infectious diseases, or merely been in contact with others suffering from them, may be infective. It is evident that impurities communicated to the air of workrooms from the abovementioned sources can best be dealt with at their origin.

Another accidental impurity, which is occasionally of importance, is ordinary lighting gas, or gas used for driving engines. Ordinary lighting gas contains about 7 per cent. of carbonic oxide. Carburetted water gas, which is often mixed with the ordinary gas, contains about 30 per cent. of carbonic oxide. Dowson and producer gas also contain about 30 per cent., while pure water gas contains nearly 50 per cent. As anything more than about .08 per cent. of carbonic oxide will produce headache, &c., after several hours' exposure, and as little as 0.2 per cent. carbonic oxide is dangerous to life, it is evident that even apart from the risks of explosion or fire, escapes of gas should not be permitted in factories or workshops. Very special care is needed with pure water gas, producer gas, Dowson gas, &c., as they have only a slight smell. It occasionally happens, also, that coal gas, when it escapes from a broken pipe underground, is, to a large extent, deodorised in passing through the ground, so that the smell is only slight when it is present in dangerous amount. Carbonic oxide is also produced in large quantities in place of carbonic acid wherever the combustion of gas is imperfect, as when a non-luminous flame used for heating purposes is allowed to "strike back." When this is the case the products of combustion have a peculiar unpleasant smell which can at once be recognised. Some forms of the gas-heated irons used in tailoring workshops, &c., are very liable to this defect, so that they require careful supervision.

When an accidental escape of lighting gas occurs above the breathing level it may happen that the gas passes up so completely towards the roof that the escape is not noticed at first, and if from any cause the upper stratum of air becomes afterwards mixed with the stratum at the breathing level the effects on persons present may be serious. Accidents of this kind have occasionally been observed in weaving sheds. The gas has been turned off at the meter on stopping work for breakfast, but through some mistake the tap has been turned too far, so that gas is left escaping all over the shed. On starting the machinery again after breakfast the action of the driving belts has mixed the upper with the lower strata of air, the result being that in a short time many of the operatives have experienced symptoms of poisoning.

An accidental impurity, which often causes serious inconvenience in manufacturing processes, and indirectly leads to the air supply being restricted to an undesirable extent, is soot and dust from the outside. Where the outside air contains much soot and dust, a room, particularly if well ventilated, is apt to serve to some extent as a settling chamber for the particles carried in by the relatively rapid currents of incoming air. With work in white materials particularly much trouble may be thus caused. In such cases it is desirable to filter the incoming air, which ought, as a rule, to be forced in by a fan, the arrangements being such that all openings, except the air inlet, act as outlets. The filtration may be effected by means of an open-meshed cloth placed diagonally along an inlet shaft so as to cause a minimum of obstruction, and occasionally removed for cleaning when it becomes choked; or a continuously acting water screen may be employed. Either of these arrangements will remove the grosser soot and dust particles, but not the finer ones. To remove the finer particles the air must be filtered through some such materials as cotton wool or slag wool. Underneath the House of Commons a cotton-wool filter is employed to filter off the fine smoke particles which abound in the air of London on days of fog. This filter is placed in the inlet air passage, and so arranged as to present a very large filtering surface (1,000 square feet).

(*To be continued.*)

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of persons registered and found employment by Government Departments and Private Employers from May 29 to June 30, 1903.

Trade or Calling.	Number Registered.		Number Employed
	Town.	Country.	
Laborers and youths	49	71	109
Masons and Bricklayers	3	1	2
Carpenters	4	1	4
Painters	7	—	—
Boilermakers and assistants	1	1	—
Blacksmiths and strikers	3	—	1
Fitters and turners	5	—	—
Enginedrivers and firemen	—	1	—
Moulders	1	—	—
Fettlers	1	—	—
Coach trimmers	2	—	—
Compositors	3	—	12
Cook	1	—	—
Warders	1	—	1
Apprentices	8	2	1
Cleaners	1	7	—
Porters and junior porters	10	6	—
Rivet boys	3	—	—
Totals	103	90	130

June 30, 1903. A. RICHARDSON, Bureau Clerk.

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